B64C

AEROPLANES; HELICOPTERS (air-cushion vehicles B60V)

Special rules of classification within this subclass

The use of the available Indexing Codes under B64C 1/00- B64C 2230/00 is mandatory for classifying additional information.

B64C 1/00

Fuselages; Constructional features common to fuselages, wings, stabilising surfaces and the like (aerodynamical features common to fuselages, wings, stabilising surfaces, and the like B64C23/00; flight-deck installations B64D)

Definition statement

This subclass/group covers:

- Overall fuselage shapes and concepts (only documents relating thereto are attributed the symbol B64C 1/00, when the emphasis is on aerodynamic aspects the symbol B64C 1/0009 is attributed).

- Structural features (including frames, stringers, longerons, bulkheads, skin panels and interior liners).

- Windows and doors (including hatch covers, access panels, drain masts, canopies and windscreens).

- Fuselage structures adapted for mounting power plants, floors, integral loading means (such as steps).

- Attachment of wing or tail units or stabilising surfaces to the fuselage;

- Relatively movable fuselage parts (for improving pilot's view or for reducing size for storage).

- Severable/jettisonable parts for facilitating emergency escape.

- Inflatable fuselage components.

- Fuselage adaptations for receiving aerials or radomes.

- Passive cooling of fuselage structures and sound/heat insulation (including isolation mats, and clips for mounting such mats and components such as pipes or cables).

References relevant to classification in this group

This subclass/group does not cover:

Aerodynamical features common to fuselages, wings, stabilising surfaces, and the like	B64C 23/00
Flight-deck installations	B64D
Structural features and concepts are attributed the relevant symbol(s) in	B64C 1/06 - B64C 1/12

Special rules of classification within this group

Structures and components for helicopters falling within this main group and/or appended subgroups are additionally attributed the symbol B64C 27/04.

As an example, a helicopter fuselage with crash absorbing frames would be attributed the symbols B64C 1/062 and B64C 27/04

B64C 1/0009

[N: Aerodynamic aspects]

Definition statement

This subclass/group covers:

Complete fuselage shapes for obtaining aerodynamic effects, e.g. reduced drag.

B64C 1/06

Frames; Stringers; Longerons

Informative references

Attention is drawn to the following places, which may be of interest for search:

plastic composite structures, frames, stringers, spars, beams, longerons, stringers and skins (also filament-wounded fuselage shells) (working with plastics)	B29C
plastic composite structures, frames, stringers, spars, beams, longerons, stringers and skins (also filament-wounded fuselage shells) (laminates)	B32B

B64C 1/061

[N: Frames]

Relationship between large subject matter areas

Fuselage bulkheads: B64C 1/10

B64C 1/063

[N: Folding or collapsing to reduce overall dimensions, e.g. foldable tail booms (folding or collapsing wings B64C3/56)]

Relationship between large subject matter areas

Parts of fuselage relatively moveable to reduce overall size for storage: B64C 1/30

References relevant to classification in this group

This subclass/group does not cover:

Folding or collapsing wings	B64C 3/56

B64C 1/064

[N: Stringers; Longerons]

Relationship between large subject matter areas

Specifically for wings: B64C 3/182

Synonyms and Keywords

In patent documents the following expressions/words "stringer" is often also used in German.

B64C 1/065

[N: Spars]

Relationship between large subject matter areas

Specifically for wings: B64C 3/185

B64C 1/066

[N: Interior liners]

Definition statement

This subclass/group covers:

Interior liners for aesthetic and/or protective purposes generally following the shape of the fuselage and visible from the inside in the completed fuselage.

References relevant to classification in this group

This subclass/group does not cover:

Sound or heat insulating mat assemblies for being positioned adjacent the fuselage outer skin	B64C 1/40

B64C 1/068

[N: Fuselage shells]

Definition statement

This subclass/group covers:

Complete fuselage structures (frames, stringers, skin) with the emphasis on structural features.

Relationship between large subject matter areas

Assembling (e.g. moving, positioning) fuselage components (e.g. barrels) into a complete fuselage: B64F 5/0009

Informative references

Attention is drawn to the following places, which may be of interest for search:

Working with plastics: documents describing plastic composite fuselage shells can also be attributed the symbols	B29C
Laminates only: when the emphasis is on manufacturing issues rather than the function in an aircraft context	B32B

B64C 1/10

Bulkheads

Definition statement

This subclass/group covers:

Aircraft fuselage bulkheads such as pressure bulkheads.

Relationship between large subject matter areas

Fuselage frames: B64C 1/061

References relevant to classification in this group

This subclass/group does not cover:

Cabin dividers for class separation	B64D 11/0023

B64C 1/12

Construction or attachment of skin panels

Relationship between large subject matter areas

Skins specifically for wings: B64C 3/26

Special rules of classification within this group

Aircraft skin structures with integral lightning protection features are concurrently attributed the symbols B64C 1/12 and B64D 45/02 (aircraft lightning protectors).

B64C 1/14

Windows; Doors; Hatch covers or access panels; Surrounding frame structures; Canopies; Windscreens [N: accessories therefor, e.g. pressure sensors, water deflectors, hinges, seals, handles, latches, windscreen wipers] (fairings movable in conjunction with undercarriage elements B64C25/16; bomb doors B64D1/06)

References relevant to classification in this group

This subclass/group does not cover:

Fairings movable in conjunction with undercarriage elements	B64C 25/16
Bomb doors	B64D 1/06

Informative references

Attention is drawn to the following places, which may be of interest for search:

Cleaning vehicle windows and windscreens	B60S 1/02 - B60S 1/606

B64C 1/1407

[N: Doors; surrounding frames]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Door and window locks, handles and latches in general	E05B
Door and window operating mechanisms in general	E05F
Doors and windows in general	E06B

B64C 1/1415

[N: Cargo doors, e.g. incorporating ramps]

Relationship between large subject matter areas

Other structures integral with the fuselage to facilitate loading (e.g. cargo bays, cranes): B64C 1/22

B64C 1/1446

[N: Inspection hatches (for engine cowls B64D29/08)]

References relevant to classification in this group

This subclass/group does not cover:

Inspection hatches for engine cowls and nacelles	B64D 29/08

B64C 1/1469

[N: Doors between cockpit and cabin]

Relationship between large subject matter areas

Anti-hijacking systems: B64D 45/0015

B64C 1/1476

[N: Canopies; Windscreens or similar transparent elements]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Windows in trains	B61D 25/00
Windows in vehicles	B60J

B64C 1/1492

[N: Structure and mounting of the transparent elements in the window or windscreen]

References relevant to classification in this group

This subclass/group does not cover:

Pyrotechnics for shattering canopies: B64C 1/32

B64C 1/16

specially adapted for mounting power plant

Relationship between large subject matter areas

Aircraft characterised by the power plant being within or attached to the fuselage (piston): B64D 27/08; (turboprop): B64D 27/14; (turbofan and turbojet): B64D 27/20

Aircraft characterised by the power plant mounting: B64D 27/26

B64C 1/18

Floors

Definition statement

This subclass/group covers:

- Construction of aircraft floors.- Decompression valves for mounting in the floor region.

B64C 1/20

specially adapted for freight

Definition statement

This subclass/group covers:

- Aircraft floors specially adapted to freight by virtue of location, strength and/or shape(s).

- Aircraft floors with anchoring points or rails for freight;

- Aircraft seat rails.

References relevant to classification in this group

This subclass/group does not cover:

Roller trays, Power Drive Units (PDU), clamping devices and other device for moving and/or securing freight	B64D 9/003

B64C 1/22

Other structures integral with fuselages to facilitate loading [N: e.g. cargo bays, cranes (cargo door type ramps B64C1/1415)]

Relationship between large subject matter areas

Equipment for handling freight in aircraft: B64D 9/00 - B64D 9/003

References relevant to classification in this group

This subclass/group does not cover:

Cargo door type ramps	B64C 1/1415

B64C 1/24

Step mounted on an retractable within fuselages (readily removable B64D9/00)

References relevant to classification in this group

This subclass/group does not cover:

Readily removable steps or stairs	B64D 9/00

B64C 1/30

Parts of fuselage relatively movable to reduce overall size for storage

Relationship between large subject matter areas

Fuselage frames enabling folding or collapsing to reduce overall dimensions: B64C 1/062

References relevant to classification in this group

This subclass/group does not cover:

Folding or collapsing wings	B64C 3/56

B64C 1/32

Severable or jettisonable parts of fuselage facilitating emergency escape (ejector seats B64D25/10)

Definition statement

This subclass/group covers:

Also includes pyrotechnics for shattering canopies.

References relevant to classification in this group

This subclass/group does not cover:

Ejection seats	B64D 25/10
Ejectable capsules	B64D 25/12

B64C 1/34

comprising inflatable structural components (connection of valves to inflatable elastic bodies B60C29/00)

References relevant to classification in this group

This subclass/group does not cover:

Connection of valves to inflatable elastic bodies	B60C 29/00
Inflatable structural components for wings	B64C 3/30
Varying camber of complete wings or parts thereof by inflatable elements	B64C 3/46

B64C 1/36

adapted to receive aerials or radomes (aerials or radomes per se H01Q)

Definition statement

This subclass/group covers:

Also covers details of the mounting of the aerial or radome to the fuselage, e.g. hinged connections for maintenance purposes

References relevant to classification in this group

This subclass/group does not cover:

Aerials or radomes per se	H01Q

B64C 1/38

Constructions adapted to reduce effects of aerodynamic or other external heating [N: (cooling structural parts of aircrafts with air flow B64D13/006)]

Definition statement

This subclass/group covers:

Cooling of the external fuselage skin

Relationship between large subject matter areas

Specifically for wings: B64C 3/36

References relevant to classification in this group

This subclass/group does not cover:

Cooling structural parts of aircraft with air from an air-treatment apparatus (e.g. environmental control system) in the aircraft	B64D 13/006
Insulation mats or blankets adjacent the fuselage skin	B64C 1/40

B64C 1/40

Sound or heat insulation, [N: e.g. using insulation blankets (insulating elements for vehicles, in general B60R13/08)]

References relevant to classification in this group

This subclass/group does not cover:

Insulating elements for vehicles in general	B60R 13/08
Cooling of the external fuselage skin	B64C 1/38

B64C 1/403

[N: Arrangement of fasteners specially adapted therefor, e.g. of clips (in vehicles in general B60R13/0206)]

References relevant to classification in this group

This subclass/group does not cover:

Clips for sound or heat insulation in vehicles in general	B60R 13/0206

Informative references

Attention is drawn to the following places, which may be of interest for search:

Fasteners in general	F16B

B64C 1/406

[N: in combination with supports for lines, e.g. for pipes or cables (arrangement of elements of electric or fluid circuits specially adapted for vehicles, in general B60R16/00; supports for pipes, cables or protective tubing F16L3/00; installations of electric cables or lines in vehicles H02G3/00)]

References relevant to classification in this group

This subclass/group does not cover:

Arrangement of elements of electric or fluid circuits specially adapted for vehicles in general	B60R 16/00
Supports for pipes, cables or protective tubing	F16L 3/00
Installations of electric cables or lines in vehicles	H02G 3/00

B64C 3/00

Wings (stabilising surfaces B64C5/00; ornithopter wings B64C33/02)

Definition statement

This subclass/group covers:

- Wing shapes (planform, airfoil profile, frontal aspect).

- Wing structures (spars, ribs, stringers, skin panels).

- Wing adaptations for accommodating power plants.

- Integral fuel tanks in the wings.

- Passive cooling of wing structures.

- Adjustment of complete wings or parts thereof (variable sweep, incidence, camber or area; warping, folding for storage purposes).

- Wings with fixed fences or spoilers.

References relevant to classification in this group

This subclass/group does not cover:

Stabilising surfaces	B64C 5/00
Ornithopter wings	B64C 33/02
Hang-glider wings (delta-shaped)	B64C 31/032
Hang-glider wings (parafoil)	B64C 31/036
Disc- or ring-shaped wings	B64C 39/06 - B64C 39/068
Flying wings	B64C 39/10

Informative references

Attention is drawn to the following places, which may be of interest for search:

Working with plastics: documents describing plastic composite fuselage shells can also be attributed the symbols	B29C
Laminates only: when the emphasis is on manufacturing issues rather than the function in an aircraft context	B32B

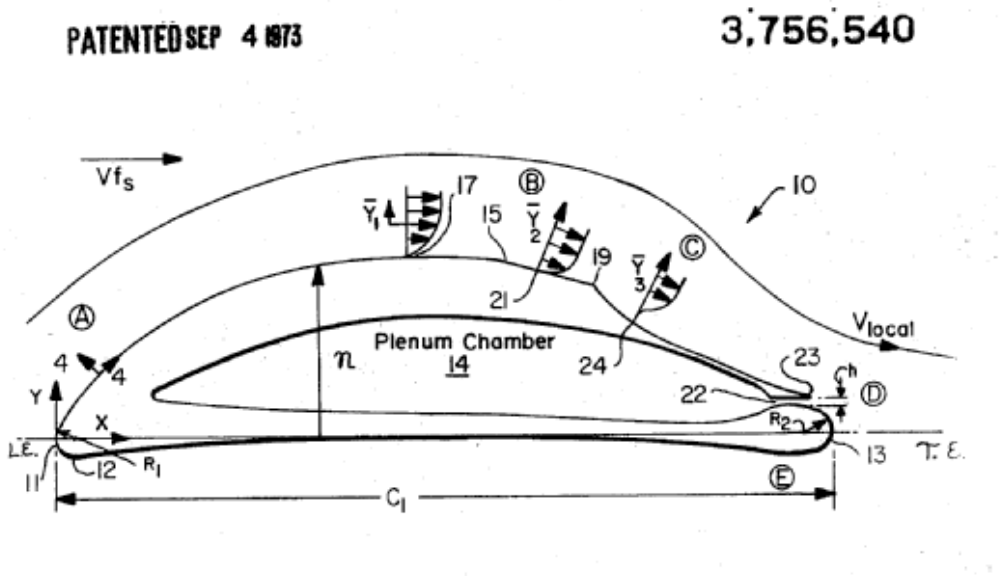
B64C 3/141

[N: Circulation Control Airfoils]

Definition statement

This subclass/group covers:

Example (from US3756540):



B64C 3/16

Frontal aspect

Definition statement

This subclass/group covers:

Shape of wing(s) when viewed from the front, e.g. dihedral, anhedral, gull-wing.

B64C 3/18

Spars; Ribs; Stringers (attaching wing unit to fuselage B64C1/26)

Relationship between large subject matter areas

For fuselages: B64C 1/06

References relevant to classification in this group

This subclass/group does not cover:

Attaching wing unit to fuselage	B64C 1/26

B64C 3/182

[N: Stringers, longerons]

Relationship between large subject matter areas

For fuselages: B64C 1/064

Synonyms and Keywords

The expression "stringer" is often also used in German

B64C 3/185

[N: Spars]

Relationship between large subject matter areas

For fuselages: B64C 1/065

B64C 3/20

Integral or sandwich constructions (layered products or sandwich constructions in general B32B)

References relevant to classification in this group

This subclass/group does not cover:

Layered products or sandwich constructions in general	B32B

B64C 3/26

Construction, shape, or attachment of separate skins, e.g. panels

Relationship between large subject matter areas

For fuselages: B64C 1/12

B64C 3/30

comprising inflatable structural components (connection of valves to inflatable elastic bodies B60C29/00)

Relationship between large subject matter areas

Inflatable structural components for fuselages: B64C 1/34

References relevant to classification in this group

This subclass/group does not cover:

Connection of valves to inflatable elastic bodies	B60C 29/00
For variation of shape, e.g. camber, for aerodynamical purposes	B64C 3/46

B64C 3/32

specially adapted for mounting power plant

Relationship between large subject matter areas

Aircraft characterised by the power plant being within or attached to the wing (piston): B64D 27/06; (turboprop): B64D 27/12; (turbofan and turbojet): B64D 27/18.

Aircraft characterised by the power plant mounting: B64D 27/26.

B64C 3/34

Integrally-constructed tanks, e.g. for fuel (other aircraft fuel tanks or fuel systems B64D)

References relevant to classification in this group

This subclass/group does not cover:

Other aircraft fuel tanks or internal fuel systems	B64D 37/00 - B64D 37/34

B64C 3/36

Structures adapted to reduce effects of aerodynamic or other external heating [N: (cooling structural parts of aircrafts with air flow B64D13/006)]

Definition statement

This subclass/group covers:
Cooling of the external wing skin

Relationship between large subject matter areas

For fuselages: B64C 1/38

References relevant to classification in this group

This subclass/group does not cover:

Cooling structural parts of aircraft with air from an air-treatment apparatus (e.g. environmental control system) in the aircraft	B64D 13/006

B64C 3/46

by inflatable elements (connection of valves to inflatable elastic bodies B60C29/00)

Definition statement

This subclass/group covers:
Example of variation of camber by inflatable elements (WO0224525):

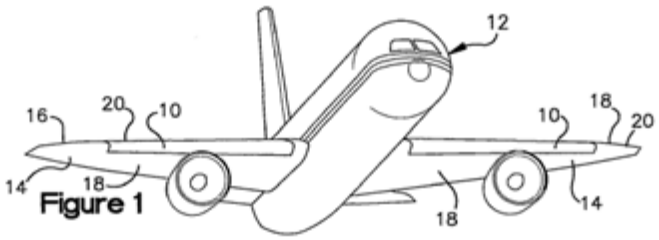


Figure 1

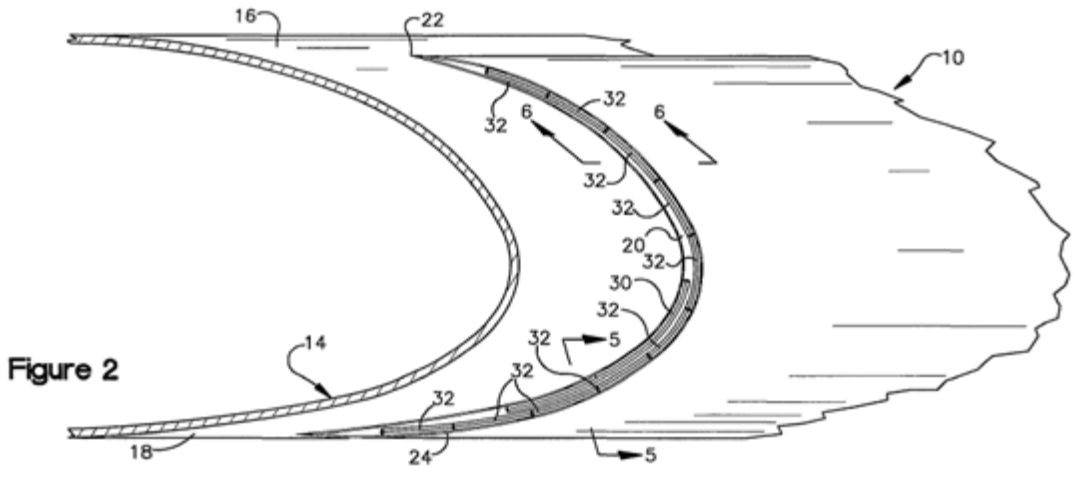


Figure 2

This subgroup also includes documents where additionally wing skins are elastic (morphing; see also Glossary of Terms). Example (EP1442976):

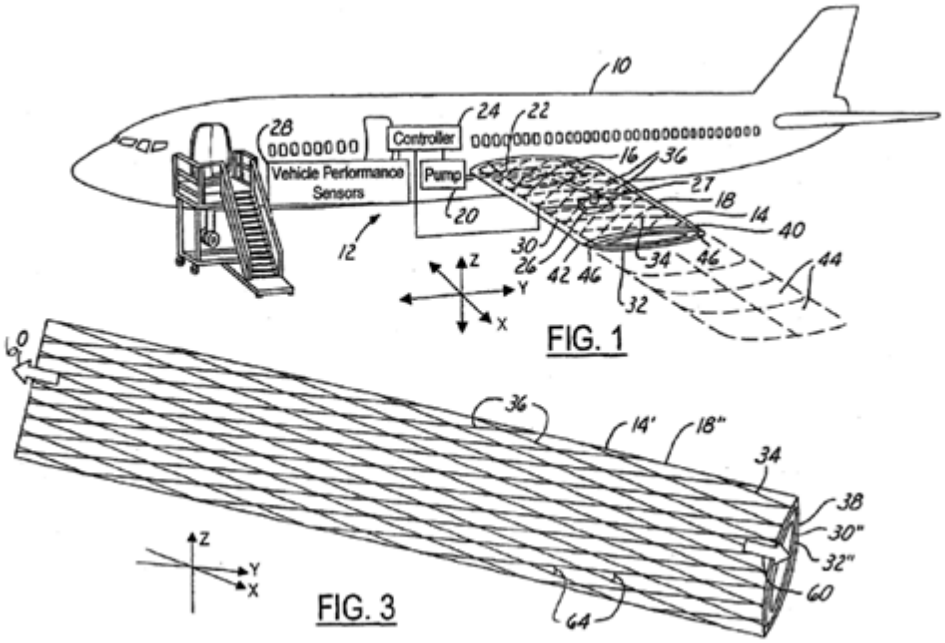


FIG. 1

FIG. 3

References relevant to classification in this group

This subclass/group does not cover:

Connection of valves to elastic bodies	B60C 29/00
Inflatable elements for deicing only (e.g. inflatable leading edge boots)	B64D 15/166

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Morphing	modification of wing shape by deformation, e.g. elastic skin

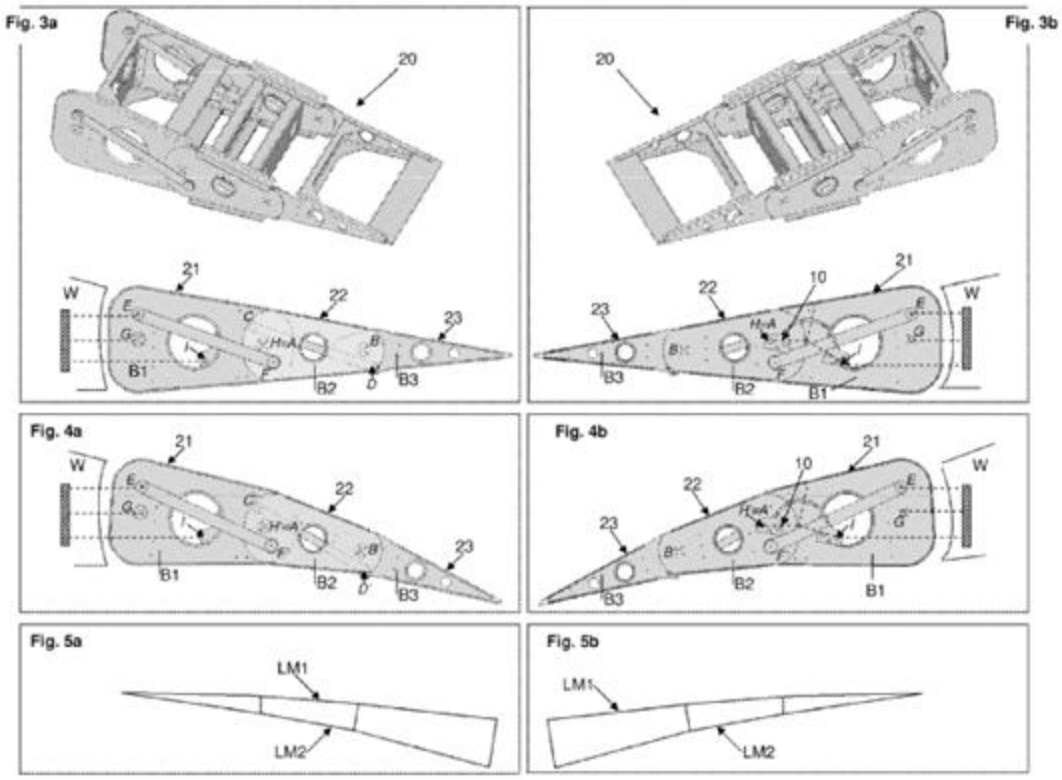
B64C 3/48

by relatively-movable parts of wing structures

Definition statement

This subclass/group covers:

Example of variation of camber by movable elements (EP2147856):



This subgroup also includes documents where additionally wing skins are elastic (morphing; see also Glossary of Terms). Example (WO2009137143):

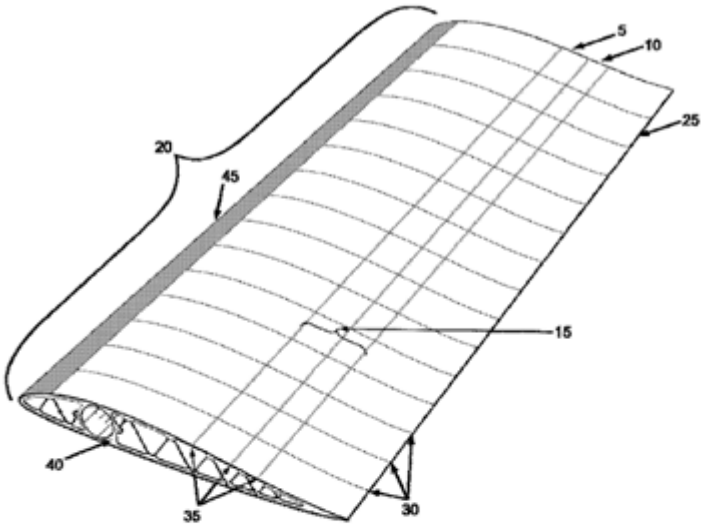


FIG. 1a

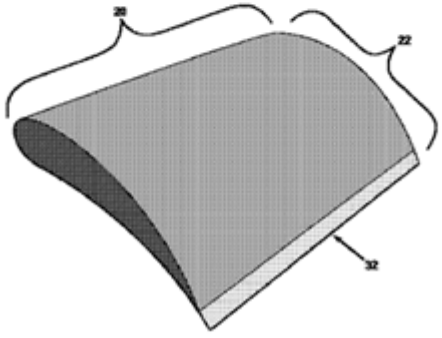


FIG. 1b

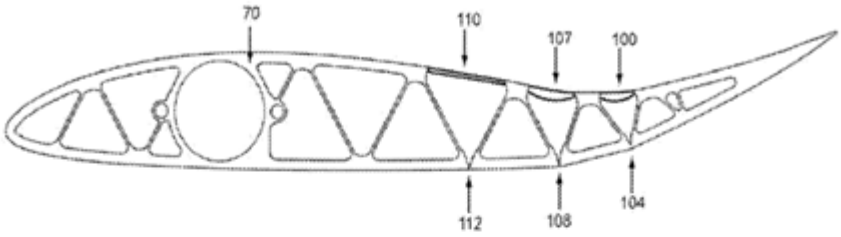


FIG. 3b

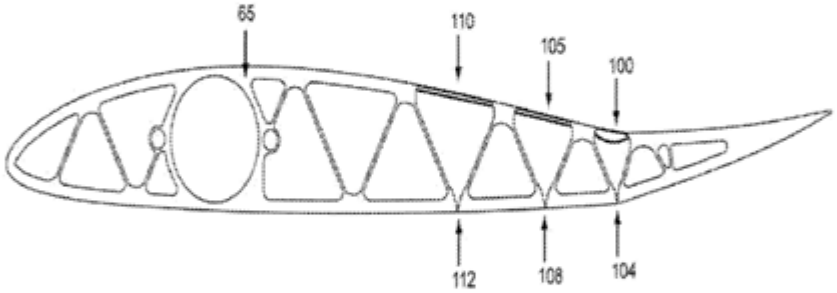


FIG. 3c

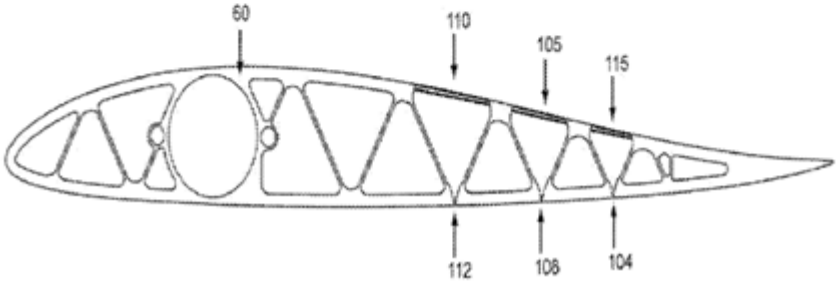


FIG. 3d

References relevant to classification in this group

This subclass/group does not cover:

Connection of valves to elastic bodies	B60C 29/00
Movable wing elements for deicing only	B64D 15/16, B64D 15/163
Inflatable elements for deicing only (e.g. inflatable leading edge boots)	B64D 15/166

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Morphing	modification of wing shape by deformation, e.g. employing elastic skin

B64C 3/50

by leading or trailing edge flaps (ailerons B64C9/00)

Definition statement

This subclass/group covers:

Integral leading and/or trailing edge parts of wings forming flaps by being movable by (elastic) deformation.

Relationship between large subject matter areas

Bodily displaceable control surfaces: B64C 9/08

References relevant to classification in this group

This subclass/group does not cover:

Ailerons	B64C 9/00
Rudders and hingedly connected flaps	B64C 9/00 - B64C 9/30

B64C 3/54

Varying in area (flaps extendable to increase camber B64C3/44)

References relevant to classification in this group

This subclass/group does not cover:

Flaps extendable to increase camber	B64C 3/44

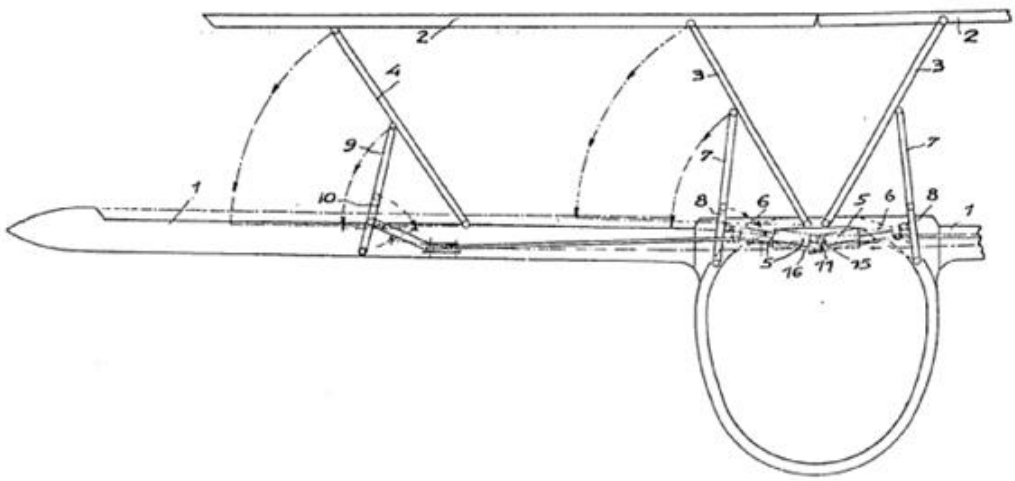
B64C 3/546

[N: by foldable elements]

Definition statement

This subclass/group covers:

Folding wings or elements thereof to provide variable aerodynamic lift.
Example (GB605075):



References relevant to classification in this group

This subclass/group does not cover:

Folding wings or elements for reducing dimensions for storage purposes	B64C 3/56

B64C 3/56

Folding or collapsing to reduce overall dimensions of aircraft

Definition statement

This subclass/group covers:

Folding or collapsible wings or elements thereof to reduce overall aircraft size for storage, as typically used by aircraft on aircraft carriers or by trailerable aircraft.

Relationship between large subject matter areas

Relatively movable fuselage parts for reducing overall size for storage: B64C 1/32

References relevant to classification in this group

This subclass/group does not cover:

Folding wings or elements thereof to provide variable, aerodynamic lift	B64C 3/546

B64C 3/58

provided with fences or spoilers (adjustable for control purposes B64C9/00)

References relevant to classification in this group

This subclass/group does not cover:

Adjustable for control purposes	B64C 9/00

B64C 5/00

Stabilising surfaces (attaching stabilising surfaces to fuselage B64C1/26)

Definition statement

This subclass/group covers:

Substantially fixed stabilising structures such as tailplanes, noseplanes and fins. Adjustable stabilising structures only when adjustment is limited and not for primary control purposes, e.g. an adjustable tail plane)

References relevant to classification in this group

This subclass/group does not cover:

Attaching stabilising surfaces to fuselage	B64C 1/26

B64C 5/02

Tailplanes (fins B64C5/06)

References relevant to classification in this group

This subclass/group does not cover:

Fins	B64C 5/06
Movable parts	B64C 9/00

B64C 5/04

Noseplanes

Relationship between large subject matter areas

Canard-type aircraft: B64C 39/12

B64C 5/06

Fins (specially for wings B64C5/08)

References relevant to classification in this group

This subclass/group does not cover:

Specially for wings	B64C 5/08

B64C 5/08

mounted on or supported by wings

Definition statement

This subclass/group covers:
Also some winglets

References relevant to classification in this group

This subclass/group does not cover:

Winglets primarily for generating vortices	B64C 23/065

B64C 5/10

adjustable

Informative references

Attention is drawn to the following places, which may be of interest for search:

Adjustable to produce different aerodynamic forces for control purposes	B64C 9/00

B64C 5/12

for retraction against or within fuselage or nacelle

Informative references

Attention is drawn to the following places, which may be of interest for search:

Adjustable to produce different aerodynamic forces for control purposes	B64C 9/34

B64C 5/14

Varying angle of sweep

Relationship between large subject matter areas

Variable wing sweep: B64C 3/40

B64C 5/16

about spanwise axes

Definition statement

This subclass/group covers:

For example horizontal stabilisers with limited movement about a spanwise axis for pitch trim.

B64C 5/18

in area (attaching stabilising surfaces to fuselage B64C1/26)

Relationship between large subject matter areas

Varying wing area for variation in lift: B64C 3/54 - B64C 3/546

References relevant to classification in this group

This subclass/group does not cover:

Attaching stabilising surfaces to fuselages	B64C 1/26

B64C 7/00

Structures or fairings not otherwise provided for

Definition statement

This subclass/group covers:

- Any structure or fairing which is not provided for elsewhere in B64;

- Sealing strips or fairings between fuselages and stabilising surfaces or wings;

- Some gap seals for control surfaces (see also B64C 9/02);

- Helicopter rotor hub fairings (see also the Special Rules of Classification below)

Relationship between large subject matter areas

Mounting control surfaces: B64C 9/02

Special rules of classification within this group

Helicopter rotor hub fairings are concurrently attributed the symbols B64C 7/00 and B64C 27/04

B64C 7/02

Nacelles

Informative references

Attention is drawn to the following places, which may be of interest for search:

Power plant nacelles	B64D 29/00

B64C 9/00

Adjustable control surfaces or members, e.g. rudders (trimming stabilising surfaces B64C5/10)

Definition statement

This subclass/group covers:

Control surfaces such as rudders, ailerons, flaps, elevators, trim/servo tabs and air brakes, as well as their mounting and balancing.

References relevant to classification in this group

This subclass/group does not cover:

Trimming stabilising surfaces	B64C 5/10

B64C 9/02

Mounting or supporting thereof

Definition statement

This subclass/group covers:

Mechanical (hinged, sliding) connections between control surfaces (e.g. aileron) and supporting part (wings).

Gap covers and seals.

Relationship between large subject matter areas

Structures and fairings not otherwise provided for: B64C 7/00

B64C 9/04

with compound dependent movements

Definition statement

This subclass/group covers:

For example flaperons

B64C 9/08

bodily displaceable (varying camber of wings B64C3/44)

References relevant to classification in this group

This subclass/group does not cover:

Varying camber of wings	B64C 3/44

B64C 9/10

one surface adjusted by movement of another, e.g. servo tabs (B64C9/04 takes precedence; adjusting surfaces of different type or function B64C9/12)

References relevant to classification in this group

This subclass/group does not cover:

Takes precedence	B64C 9/04
Adjusting surfaces of different type of function	B64C 9/12

B64C 9/14

forming slots (boundary-layer control B64C21/00)

Relationship between large subject matter areas

Fixed leading or trailing edge slots: B64C 3/28

References relevant to classification in this group

This subclass/group does not cover:

Boundary-layer control	B64C 21/00

B64C 9/146

[N: at an other wing location than the rear or the front (wings provided with fixed fences or spoilers B64C3/58)]

References relevant to classification in this group

This subclass/group does not cover:

Wings provided with fixed fences or spoilers	B64C 3/58

B64C 9/16

at the rear of the wing

Definition statement

This subclass/group covers:

Mainly actuating connections and linkages in the region of the flap and the supporting structure (e.g. wing), as well as further details such as covers. Aerodynamic (airflow) aspects are attributed B64C 9/18 (single flaps) or B64C 9/20 (multiple flaps).

This and the associated subgroups also covers trailing edge flaps where no slot is formed (e.g. conventional split flaps)

B64C 9/18

by single flaps

Definition statement

This subclass/group covers:

- Aerodynamic (airflow) aspects.- Single flap in a given chordwise direction.

B64C 9/20

by multiple flaps

Definition statement

This subclass/group covers:

- Aerodynamic (airflow) aspects.

- Multiple flaps in a given chordwise direction.

B64C 9/22

at the front of the wing

Definition statement

This subclass/group covers:

Mainly actuating connections and linkages in the region of the flap and the supporting structure (e.g. wing), as well as further details such as covers. Aerodynamic (airflow) aspects are attributed B64C 9/24 (single flaps) or B64C 9/26 (multiple flaps).

This and the associated subgroups also covers leading edge flaps where no slot is formed (e.g. conventional Krüger flaps).

B64C 9/24

by single flap

Definition statement

This subclass/group covers:

- Aerodynamic (airflow) aspects.

- Single flap in a given chordwise direction.

B64C 9/26

by multiple flaps

Definition statement

This subclass/group covers:

- Aerodynamic (airflow) aspects.

- Multiple flaps in a given chordwise direction.

B64C 9/32

Air braking surfaces (braking by parachutes B64D17/80)

Relationship between large subject matter areas

Stabilising surfaces for retraction against or within fuselage or nacelle: B64C 5/12

References relevant to classification in this group

This subclass/group does not cover:

Braking by parachutes	B64D 17/80

B64C 9/34

collapsing or retracting against or within other surfaces or other members

Relationship between large subject matter areas

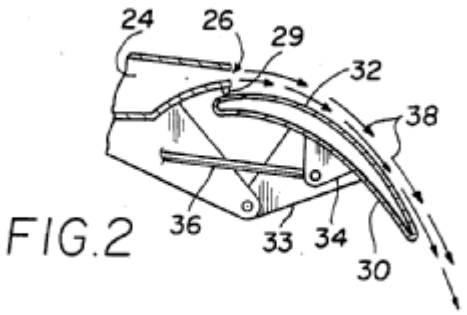
Stabilising surfaces for retraction against or within fuselage or nacelle: B64C 5/12

B64C 9/38

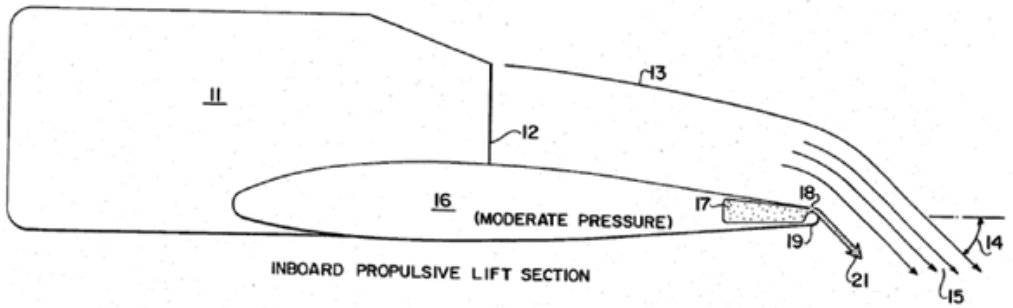
Jet flaps

Definition statement

This subclass/group covers:
Example (US4674716):



Example (US4398687):



B64C 11/00

Propellers, e.g. of ducted type; Features common to propellers and rotors for rotorcraft (rotors specially adapted for rotorcraft B64C27/32)

Definition statement

This subclass/group covers:
- Propeller hubs, blades and pitch-changing mechanisms.

- Propeller vibration absorbing or balancing means.- Arrangements of multiple propellers (e.g. coaxial propellers).

- Active or passive propeller measures for noise reduction (only such disclosures are attributed the symbol B64C 11/00).

Relationship between large subject matter areas

Helicopter rotor blades with tips for noise reduction: B64C 27/463

References relevant to classification in this group

This subclass/group does not cover:

In marine propulsion	B63H
In rotors and blades for rotorcraft	B64C 27/021, B64C 27/32, B64C 27/46
In gas turbines (except for some documents relating to propellers of the "unducted fan" or "open rotor" type)	F02C, F01D
In wind motors/generators	F03D
In pumps	F04D
In (domestic) ventilation fans	F04D

Special rules of classification within this subclass/group

Propellers and associated components are only attributed B64C 11/00 and/or associated subgroup symbols when they are disclosed as being for use with aircraft, generally for producing longitudinal thrust.

B64C 11/008

[N: characterised by vibration absorbing or balancing means (for rotorcraft B64C27/001)]

References relevant to classification in this group

This subclass/group does not cover:

For rotorcraft	B64C 27/001

B64C 11/22

Solid blades

Definition statement

This subclass/group covers:
Mainly wooden blades.

B64C 11/24

Hollow blades

Definition statement

This subclass/group covers:
Mainly metal blades.

B64C 11/26

Fabricated blades

Definition statement

This subclass/group covers:
Mainly composite blades.

B64C 11/46

Arrangements of or constructional features peculiar to multiple propellers [N: (B64C11/306 takes precedence)]

Definition statement

This subclass/group covers:
This and the associated subgroups B64C 11/48 and B64C 11/50 can also cover multiple propellers of the "unducted fan" or "open rotor" type.

References relevant to classification in this group

This subclass/group does not cover:

Takes precedence	B64C 11/306

B64C 13/00

Control systems or transmitting systems for actuating flying-control surfaces, lift-increasing flaps, air brakes, or spoilers

Definition statement

This subclass/group covers:

- Control sticks and yokes, stick shakers, tactile or force-feedback.

- Mechanical, fluid or electric transmission means to the control surface(s), including use of autopilots, fly-by-wire and fly-by-light.

References relevant to classification in this group

This subclass/group does not cover:

Asymmetric flap detection	B64D 45/0005

B64C 13/04

actuated personally

Definition statement

This subclass/group covers:

Control sticks and yokes as well as associated components and details in the region thereof.

Relationship between large subject matter areas

Initiating means in rotorcraft: B64C 27/56

Informative references

Attention is drawn to the following places, which may be of interest for search:

Controlling members in general (e.g. joysticks, handles)	G05G

B64C 13/06

adjustable to suit individual persons

Definition statement

This subclass/group covers:

For example longitudinal adjustment of rudder pedal assemblies.

B64C 13/10

comprising warning devices

Definition statement

This subclass/group covers:

- Vibrating control sticks or yokes ("stick shakers").

- Tactile cueing

Relationship between large subject matter areas

Artificial feel (e.g. "force feedback") in the transmitting system: B64C 13/46

B64C 13/14

lockable (locking in position to suit individual persons B64C13/06)

Definition statement

This subclass/group covers:

For example locking a yoke against the dashboard to lock the control surfaces against wind gusts

References relevant to classification in this group

This subclass/group does not cover:

Locking in position to suit individual persons	B64C 13/06

B64C 13/16

actuated automatically, e.g. responsive to gust detectors

Definition statement

This subclass/group covers:

Also covers for example automatic rudder/aileron deflection to counter

asymmetric thrust.

Relationship between large subject matter areas

Automatic or condition responsive initiating members in rotorcraft: B64C 27/57.

Fly-by-wire or fly-by-light: B64C 13/503.

Automatic or condition responsive initiating members in aircraft power plant control: B64D 31/06 - B64D 31/12.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Autopilots, stability augmentation systems, gust detection response and yaw dampers per se and with the emphasis on control technology	G05D 1/00 - G05D 1/12

B64C 13/18

using automatic pilot

Definition statement

This subclass/group covers:

Autopilots, stability augmentation systems, yaw dampers, mostly in the context of the whole or a major part of the transmitting system.

Relationship between large subject matter areas

Fly-by-wire or fly-by-light: B64C 13/503.

B64C 13/20

using radiated signals

Definition statement

This subclass/group covers:

For example radio control

Relationship between large subject matter areas

Remote controlled aircraft (unmanned aerial vehicles): B64C 39/024.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Air traffic control	G08G
Remote controlled toy aircraft	A63H 27/00

B64C 13/22

readily revertible to personal control

Definition statement

This subclass/group covers:

For example unmanned aerial vehicles, which can also be flown by a pilot (e.g. aircraft converted to "drones" or aerial targets).

B64C 13/24

Transmitting means

Definition statement

This subclass/group covers:

Transmitting means between the initiating means (e.g. control stick) and the control surface (e.g. aileron).

Documents relating to power amplifying actuators (fluid, electric, mechanic) in aircraft control surfaces transmitting means are attributed this and the symbols of the associated subclasses when their use, mounting and/or function in the context of the transmitting means as a whole is described.

B64C 13/34

using toothed gearing

Definition statement

This subclass/group covers:

Only intermeshing toothed gearing.

B64C 13/40

using fluid pressure

Definition statement

This subclass/group covers:

Documents disclosing duplication or stand-by provisions (cf. B64C 13/42), overriding of personal controls (cf. B64C 13/44) or artificial feel (force feedback; cf. B64C 13/46) are attributed these symbols even if the power amplification is not by fluid pressure.

Also covers some hydraulic circuits.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Hydraulic circuits	F15B

B64C 13/44

overriding of personal controls; with automatic return to inoperative position

Relationship between large subject matter areas

Automatically activated personal initiating means: B64C 13/16 - B64C 13/22.

Automatic or condition responsive personal initiating members in rotorcraft: B64C 27/57.

Automatic or condition responsive initiating members in aircraft power plant control: B64D 31/06 - B64D 31/12.

B64C 13/46

with artificial feel

Relationship between large subject matter areas

Personally activated initiating means with warning devices (e.g. "stick shakers", tactile cueing): B64C 13/10.

B64C 13/503

[N: Fly-by-Wire]

Definition statement

This subclass/group covers:
Also covers fly-by-light.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Fly-by-wire or fly-by-light technology with the emphasis on control technology	G05D 1/00 - G05D 1/12

B64C 15/00

Attitude, flight direction, or altitude control by jet reaction

Definition statement

This subclass/group covers:
Control of aircraft by jet(s) generated by any means (including propellers).

References relevant to classification in this group

This subclass/group does not cover:

Vertical take-off and landing (VTOL) aircraft	B64C 29/00

B64C 15/02

the jets being propulsion jets

Definition statement

This subclass/group covers:
Thrust vectoring.

Relationship between large subject matter areas

See also B64D 33/04 for arrangements of exhaust outlets or jet pipes.

B64C 15/12

the power plant being tiltable

Definition statement

This subclass/group covers:

Thrust vectoring obtained by rotating the power unit as a whole.

B64C 15/14

the jets being other than main propulsion jets (jet flaps B64C9/38)

Definition statement

This subclass/group covers:

Aircraft control obtained by using dedicated jets.

References relevant to classification in this group

This subclass/group does not cover:

Jet flaps	B64C 9/38
Boundary layer control	B64C 21/04

B64C 17/00

Aircraft stabilisation not otherwise provided for

Definition statement

This subclass/group covers:

This group contains documents concerning aircraft stabilisation which are not classified in e.g. B64C 5/00.

B64C 17/02

by gravity or inertia-actuated apparatus

Definition statement

This subclass/group covers:

Stability control by e.g. shifting the CoG

B64C 17/04

by pendular bodies

Definition statement

This subclass/group covers:

Pendulum stability is achieved when the centre of lift is above the CoG of the aircraft, or by using a dedicated pendulum.

B64C 17/06

by gyroscopic apparatus (automatic pilot control B64C13/18)

Definition statement

This subclass/group covers:

A gyro is used to directly stabilize the aircraft.

References relevant to classification in this group

This subclass/group does not cover:

Automatic pilot control	B64C 13/18

B64C 17/08

by ballast supply or discharge (for lighter-than-air aircraft B64B)

Relationship between large subject matter areas

See B64B for lighter-than-air aircraft.

B64C 17/10

Transferring fuel to adjust trim

Definition statement

This subclass/group covers:

Displacement of the CoG, aimed at reaching a desired trim condition, is achieved by fuel transfer between the internal tanks of the aircraft.

B64C 19/00

Aircraft control not otherwise provided for

Definition statement

This subclass/group covers:

Control of aircraft by using e.g. gyroscopic effects, vortex generators, moving aircraft parts and/or surfaces not provided for in B64C 9/00OR, in general, systems not provided for in B64C 13/00OR B64C 15/00.

B64C 21/00

Influencing air-flow over aircraft surfaces by affecting boundary-layer flow (boundary-layer control in general F15D)

Definition statement

This subclass/group covers:

Any device/method operating within the airfoil boundary layer to influence the air flow around the airfoil, especially in order to control boundary layer separation.

Relationship between large subject matter areas

Classify also in B64C 23/00IF necessary.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Boundary layer control in general	F15D 1/00
Hydrodynamic or hydrostatic features	B63B 1/34

B64C 21/02

by use of slot, ducts, porous areas, or the like

Definition statement

This subclass/group covers:

Cavities, slots, holes along a structural surface whereby the net flow is null.

B64C 21/025

[N: for simultaneous blowing and sucking]

Definition statement

This subclass/group covers:

Fluid is blown and sucked

References relevant to classification in this group

This subclass/group does not cover:

Takes precedence	B64C 21/08

B64C 21/04

for blowing (B64C21/08 takes precedence)

Definition statement

This subclass/group covers:
Fluid is only blown.

References relevant to classification in this group

This subclass/group does not cover:

Takes precedence	B64C 21/08

B64C 21/06

for sucking (B64C21/08 takes precedence)

Definition statement

This subclass/group covers:
Fluid is only sucked

References relevant to classification in this group

This subclass/group does not cover:

Takes precedence	B64C 21/08

B64C 21/08

adjustable

Definition statement

This subclass/group covers:

Fluid flow is explicitly adjustable by e.g. valves, variable aperture or slot area, variable pump action or fluid pressure.

References relevant to classification in this group

This subclass/group does not cover:

Always classify, in the case or blown and/or sucked fluid, also in B64C 21/025 or B64C 21/04 or B64C 21/06.

B64C 21/10

using other surface properties, e.g. roughness

Special rules of classification within this group

The properties referred to are e.g. roughness or riblets.

B64C 23/00

Influencing air-flow over aircraft surfaces, not otherwise provided for

Definition statement

This subclass/group covers:

Air-flow over aircraft surfaces influenced e.g. by magnetic, electric or piezoelectric panels, by static charges, by ultrasound, by special shape, by rotating bodies.

Relationship between large subject matter areas

Influencing boundary layer: B64C 21/00.

References relevant to classification in this group

This subclass/group does not cover:

Attitude control by jet reaction	B64C 15/00

B64C 23/005

[N: by other means not covered by groups B64C23/02 to B64C23/08, e.g. by electric charges, magnetic panels, piezoelectric elements, static charges or ultrasounds]

Relationship between large subject matter areas

Also B64C 21/00IF boundary layer explicitly involved.

B64C 23/02

by means of rotating members of cylindrical or similar form

Relationship between large subject matter areas

Circulation control airfoils: B64C 3/141

Using Magnus effect: B64C 23/08

References relevant to classification in this group

This subclass/group does not cover:

The rotating body has exclusively a cylindrical form.	

B64C 23/04

by generating shock waves

Definition statement

This subclass/group covers:

Shock wave modification devices and methods. Reduction of shock drag as main searched technical effect.

Relationship between large subject matter areas

Supersonic type aircraft	B64C 30/00
Specific airfoil shape	B64C 3/14

B64C 23/06

by generating vortices

Relationship between large subject matter areas

Fins mounted on wings	B64C 5/08

B64C 23/065

[N: at the wing tip, e.g. winglets, splines]

Definition statement

This subclass/group covers:
Devices of any type (winglets, fins, turbines, splines) arranged at the wing tip.

Relationship between large subject matter areas

Helicopter rotor blades tips: B64C 27/463

Fins on wings: B64C 5/08

B64C 23/06A2

[N: using winglets]

Definition statement

This subclass/group covers:
Exclusively winglets.

B64C 23/06A2M

[N: movable or including movable members]

Definition statement

This subclass/group covers:
Exclusively moving winglets or winglets with moving elements thereon.

B64C 23/08

using Magnus effect

Definition statement

This subclass/group covers:
Devices having a cylindrical or spherical form which explicitly generate a force by using the Magnus effect.

Relationship between large subject matter areas

Circulation control airfoils: B64C 3/141

B64C 25/00

Alighting gear (air-cushion alighting gear B60V3/08)

Definition statement

This subclass/group covers:

- Any structure that supports/arrest the aircraft on a surface.- Wheels supported by shock absorbers, skis, floats, pontoons or combinations thereof.- Braking systems specific for aircraft.

- Arrester hooks. Control/actuating systems thereof.

References relevant to classification in this group

This subclass/group does not cover:

Air-cushion alighting gear	B60V 3/08

B64C 25/04

Arrangement or disposition on aircraft

Definition statement

This subclass/group covers:

Arrangement or disposition on aircraft with respect to the aircraft structure. Inter-relationship thereof.

B64C 25/16

Fairings movable in conjunction with undercarriage elements

Definition statement

This subclass/group covers:

Systems for opening and closing undercarriage door bays. Fairings in general whose movement is performed in conjunction with the landing gear movement.

B64C 25/18

Operating mechanisms

Definition statement

This subclass/group covers:

General methods and systems for operating unspecified aircraft landing gears.

B64C 25/20

mechanical

Definition statement

This subclass/group covers:

Operating mechanisms comprising levers, pulleys, cables, gear wheels and/or characterised essentially by the kinematic aspects of the retracting/folding displacement.

Relationship between large subject matter areas

Locking mechanisms: B64C 25/26

B64C 25/22

fluid

Definition statement

This subclass/group covers:

Operating mechanisms characterised by the control circuits/operating actuators being hydraulic or pneumatic.

B64C 25/24

electric

Definition statement

This subclass/group covers:

Operating mechanisms characterised by using electrical or electromagnetic actuators.

B64C 25/26

Control or locking systems therefor

Definition statement

This subclass/group covers:

Uplock assemblies for retaining and releasing landing gear systems, bracing locking devices, undercarriage locking and unlocking systems in general.

Relationship between large subject matter areas

Operating systems, mechanical aspects: B64C 25/20

B64C 25/28

with indicating or warning devices

Definition statement

This subclass/group covers:

Ground lock detection devices, landing gear warning systems, landing gear verification systems.

Relationship between large subject matter areas

Devices specially adapted to indicate the position of a movable element of the aircraft, e.g. landing gear	B64D 45/0005

B64C 25/30

emergency actuated

Definition statement

This subclass/group covers:

Emergy release/actuation actuators and relevant control.

Relationship between large subject matter areas

Devices specially adapted to indicate the position of a movable element of the aircraft, e.g. landing gear	B64D 45/0005

B64C 25/32

characterised by the ground or like engaging elements (arrester hooks B64C25/68)

References relevant to classification in this group

This subclass/group does not cover:

Arrester hooks: B64C 25/68

B64C 25/36

Arrangements or adaptations of wheels, tyres, or axles in general (construction of wheels or axles B60B; construction of tyres in general B60C)

Informative references

Attention is drawn to the following places, which may be of interest for search:

Construction of wheels or axles	B60B
Construction of tyres	B60C

B64C 25/38

Endless-track type

Definition statement

This subclass/group covers:

693,626 COMPLETE SPECIFICATION

3 SHEETS

This drawing is a reproduction of the Original on a reduced scale.

SHEETS 1 & 2

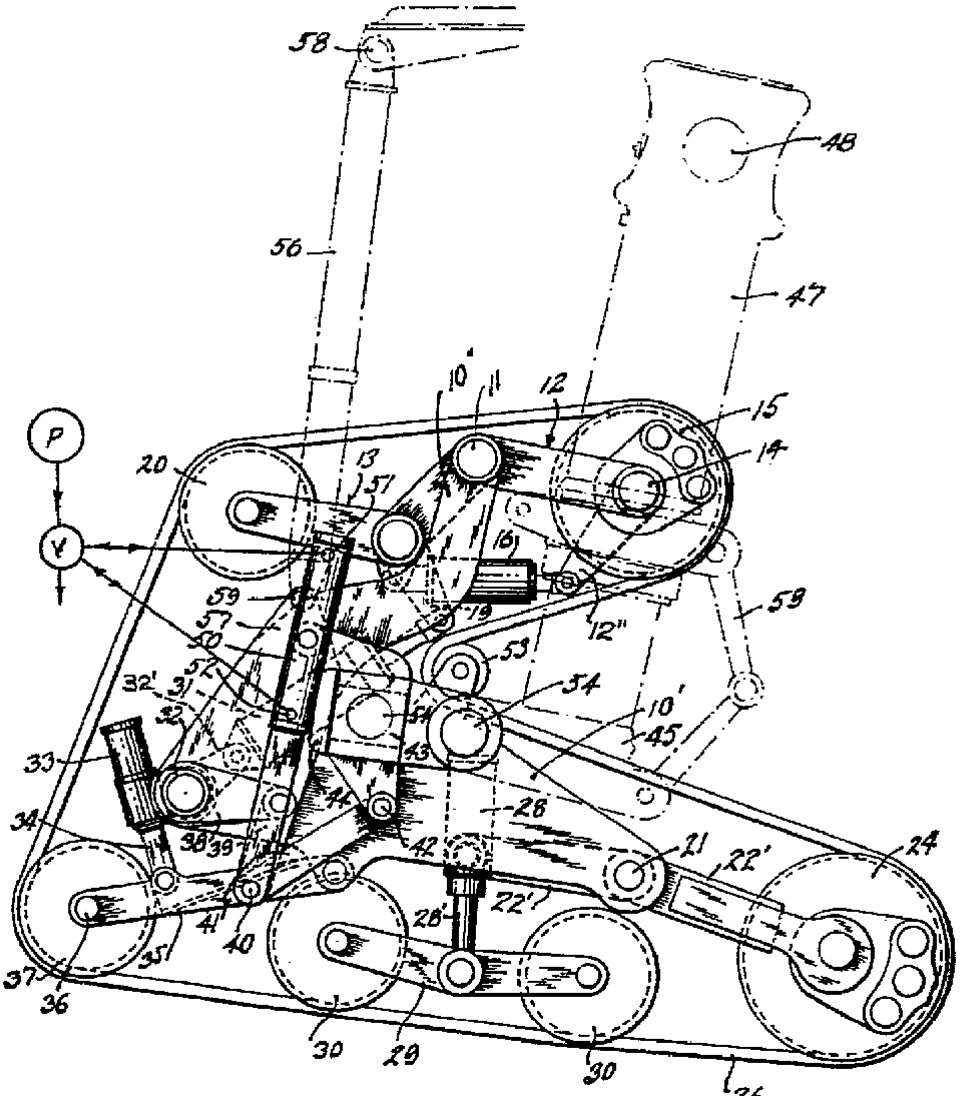


FIG. 2.

B64C 25/40

the elements being rotated before touch-down

Definition statement

This subclass/group covers:

Pre-landing acceleration devices for aircraft wheels, generally passive.

B64C 25/405

[N: Powered wheels, e.g. for taxing]

Definition statement

This subclass/group covers:

Motorised wheels, any type of motor or installation thereof.

B64C 25/42

Arrangements or adaptations of brakes (the ground braking force being regulated, at least in part, by a speed condition, e.g. acceleration or deceleration of the ground engaging alighting gear, B60T8/32)

References relevant to classification in this group

This subclass/group does not cover:

The ground braking force being regulated, at least in part, by a speed condition, e.g. acceleration or deceleration of the ground engaging alighting gear	B60T 8/32

Informative references

Attention is drawn to the following places, which may be of interest for search:

Vehicle brake control systems or parts thereof	B60T

B64C 25/423

[N: Braking devices acting by reaction of gaseous medium (B64C25/426 takes precedence; using rockets B64D27/023)]

References relevant to classification in this group

This subclass/group does not cover:

Takes precedence	B64C 25/426

Using rockets	B64D 27/023
Thrust reversers	B64D 33/04

Special rules of classification within this group

Originally meant for covering e.g. thrust reversers it is no longer used in this respect.

Thrust reversers shall not be classified in B64C 25/423.

B64C 25/426

[N: Braking devices providing an automatic sequence of braking]

Definition statement

This subclass/group covers:

Braking methods/systems wherein the braking sequence is controlled by an electronic control unit and performed in accordance with predetermined steps, including controlling the brakes independently, to achieve a predetermined target, e.g. to achieve a predetermined deceleration rate or to optimize the braking force.

B64C 25/44

Actuating mechanisms

Definition statement

This subclass/group covers:

Regulators, disks, valves.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Arrangements of brakes specially adapted for aircraft	B60T 8/325

B64C 25/46

Brake regulators for preventing skidding or aircraft somersaulting [N: (anti-skidding regulators; electric or electronic controllers therefor B60T8/1703)]

Informative references

Attention is drawn to the following places, which may be of interest for search:

Anti-skidding regulators; electric or electronic controllers therefor	B60T 8/1703

B64C 25/50

Steerable undercarriages; Shimmy damping (steering devices applicable to land vehicles B62D)

Definition statement

This subclass/group covers:

Undercarriages whcih can be steered, relevant control systems and actuators, steering angle warning systems.

Relationship between large subject matter areas

When operated in combination with towing vehicles: B64F 1/22

B64C 25/505

[N: Shimmy damping]

Definition statement

This subclass/group covers:

Wheel shimmy is a condition in which the landing gear wheel or wheels oscillate from side to side along a straight line parallel to the direction of travel of the aircraft. Documents concerning this problem are classified here.

B64C 25/52

Skis or runners

Definition statement

This subclass/group covers:

Skis, skids, runners, various ground engaging structures, especially suitable for helicopters.

Relationship between large subject matter areas

Safety devices for helicopters: B64C 27/006

B64C 25/56

inflatable (connection of valves to inflatable elastic bodies B60C29/00)

Definition statement

This subclass/group covers:

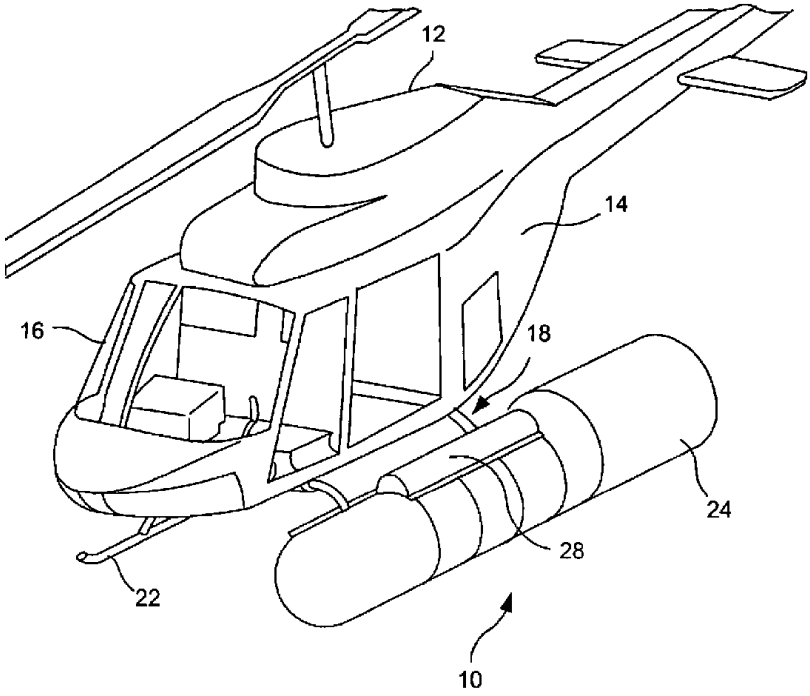


FIG. 2

B64C 25/58

Arrangements or adaptations of shock-absorbers or springs (shimmy dampers B64C25/50; vehicle suspension arrangements in general B60G; shock absorber per se F16F)

Relationship between large subject matter areas

Shimmy dampers: B64C 25/505

Informative references

Attention is drawn to the following places, which may be of interest for search:

Suspensions in generals	B60G
Shock absorbers per se	F16F

B64C 25/60

Oleo legs

Definition statement

This subclass/group covers:

Any shock absorber comprising hydraulic or pneumatic cylinders.

B64C 25/66

Convertible alighting gear; Combinations of different kinds of ground or like engaging elements

Definition statement

This subclass/group covers:

The ground engaging elements can be converted from e.g. wheeled to floats or skis and vice-versa depending on the specific landing surface.

B64C 25/68

Arrester hooks (arresting gear, e.g. on aircraft carriers B64F)

Definition statement

This subclass/group covers:

Comprises capturing/retrieving systems on aircraft.

Relationship between large subject matter areas

Arresting/launching/towing gears: B64F 1/02, B64F 1/04

B64C 27/00

Rotorcraft; Rotors peculiar thereto (alighting gear B64C25/00)

Definition statement

This subclass/group covers:

- Vibration damping, safety devices and rotor tracking/balancing devices for rotorcraft rotors.

- Gyroplanes and autogyros, and rotors therefor.

- Helicopters, flying platforms and compound rotorcraft/helicopters.

- Rotors (including tail rotors), hubs, blades and rotor blade adjustment control (including flying controls, such as collective and pitch levers).

References relevant to classification in this group

This subclass/group does not cover:

Alighting gear for rotorcraft	B64C 25/00

B64C 27/001

[N: Vibration damping devices]

Definition statement

This subclass/group covers:

Vibration or noise damping by means of isolators on the rotor head, suspended masses, actuators acting on the complete rotor assembly or active noise cancellation.

References relevant to classification in this group

This subclass/group does not cover:

Noise or vibration damping by specifically shaped rotor blade tips	B64C 27/463
Noise or vibration damping by individual rotor blade control using flaps on the blades	B64C 27/615
Noise or vibration damping by individual control of rotor blades using individual actuators	B64C 27/72

B64C 27/006

[N: Safety devices]

Definition statement

This subclass/group covers:

For example wire cutters or detectors, helicopter-specific use of airbags, distance sensors for tail booms, rotor blade crack detection, tail rotor guards, emergency tail rotor drives or emergency anti-torque means.

Relationship between large subject matter areas

Aircraft emergency devices: B64D 25/00

B64C 27/008

[N: Rotors tracking or balancing devices]

Definition statement

This subclass/group covers:

For example rotor blade tip weights or rotor blade tracking apparatus and methods.

B64C 27/021

[N: Rotor or rotor head construction (for helicopters B64C27/32)]

References relevant to classification in this group

This subclass/group does not cover:

For helicopters	B64C 27/32

B64C 27/04

Helicopters

Special rules of classification within this group

The following helicopter components are not attributed any of the symbols in B64C 27/00 but only the symbol B64C 27/04 and one of the following associated, applicable symbols:

Fuselage structures and windows:B64C 1/00 - B64C 1/40

Rotor hub fairings:B64C 7/00

Armament:B64D 7/00 - B64D 7/08

Underslung loads: B64D 1/22

Mounting cameras: B64D 47/08

B64C 27/20

Rotorcraft characterised by having shrouded rotors, e.g. flying platforms

Relationship between large subject matter areas

Shrouded propellers: B64C 11/001

Unmanned aerial vehicles: B64C 39/024

References relevant to classification in this group

This subclass/group does not cover:

With wings	B64C 29/0025

B64C 27/28

with forward-propulsion propellers pivotable to act as lifting rotors

Definition statement

This subclass/group covers:
Mostly tiltrotor aircraft requiring an anti-torque tail rotor.

References relevant to classification in this group

This subclass/group does not cover:

Takes preference	B64C 29/0033

B64C 27/32

Rotors (features common to rotors and propellers B64C11/00)

Definition statement

This subclass/group covers:
Rotor hubs, special or unconventional rotors.

Relationship between large subject matter areas

Propeller hubs: B64C 11/02

References relevant to classification in this group

This subclass/group does not cover:

Features common to rotors and propellers	B64C 11/00

B64C 27/33

having flexing arms

Definition statement

This subclass/group covers:
Flexbeams for rigid rotors.

Relationship between large subject matter areas

Root attachment to rotor head: B64C 27/48

B64C 27/35

having elastomeric joints

Definition statement

This subclass/group covers:
Elastomeric joints for articulated rotors

Informative references

Attention is drawn to the following places, which may be of interest for search:

Springs	F16F

B64C 27/37

having articulated joints (B64C27/33, B64C27/35 take precedence)

References relevant to classification in this group

This subclass/group does not cover:

Take preference	B64C 27/33, B64C 27/35

B64C 27/467

Aerodynamic features [N: (B64C27/463 takes precedence)]

References relevant to classification in this group

This subclass/group does not cover:

Takes preference	B64C 27/463

B64C 27/473

Constructional features [N: (B64C27/463 takes precedence)]

Relationship between large subject matter areas

Constructional features for propeller blades: B64C 11/20 - B64C 11/26

References relevant to classification in this group

This subclass/group does not cover:

Takes preference	B64C 27/463
Rotors for wind motors	F03D

B64C 27/48

Root attachment to rotor head

Relationship between large subject matter areas

Root attachment of propeller blades: B64C 11/04 - B64C 11/12

B64C 27/50

Blades foldable to facilitate stowage of aircraft

Relationship between large subject matter areas

Foldable propeller blades: B64C 11/28

For autogyros: B64C 27/022

B64C 27/51

[N: Damping of blade movements]

Relationship between large subject matter areas

Transmitting means for controlling lead-lag movement of rotor blades: B64C 27/635

B64C 27/52

Tilting of rotor bodily relative to fuselage (of see-saw type construction B64C27/43)

References relevant to classification in this group

This subclass/group does not cover:

See-saw type construction	B64C 27/43

B64C 27/56

Initiating means, e.g. actuated personally

Definition statement

This subclass/group covers:

Cyclic sticks and collective levers as well as associated components and details in the region thereof.

Relationship between large subject matter areas

Personal control surface initiating means in aeroplanes: B64C 13/04

Informative references

Attention is drawn to the following places, which may be of interest for search:

Controlling members in general (e.g. joysticks, handles)	G05G

B64C 27/57

automatic or condition responsive, e.g. responsive to rotor speed, torque or thrust

Definition statement

This subclass/group covers:

Can also cover maintaining hover position or attitude.

Relationship between large subject matter areas

Automatic or condition responsive initiating members in aeroplanes: B64C 13/16 - B64C 13/22

Fly-by-wire or fly-by-light: B64C 13/503

Automatic or condition responsive initiating members in aircraft power plant control: B64D 31/06 - B64D 31/12

Informative references

Attention is drawn to the following places, which may be of interest for search:

With the emphasis on control technology	G05D 1/00 - G05D 1/12

B64C 27/58

Transmitting means

Definition statement

This subclass/group covers:

Transmitting means downstream of the cyclic stick and the collective lever.

Relationship between large subject matter areas

Transmitting means for aeroplanes: B64C 13/24 - B64C 13/503

B64C 27/72

Means acting on blades

Definition statement

This subclass/group covers:

Individual blade control by acting directly on the blade, e.g. by a separate actuator for each blade.

References relevant to classification in this group

This subclass/group does not cover:

Individual rotor blade control using flaps on the blades	B64C 27/615

B64C 29/00

Aircraft capable of landing or taking-off vertically (attitude, flight direction, or altitude control by jet reaction B64C15/00; rotorcraft B64C27/00; air-cushion vehicles B60V)

Definition statement

This subclass/group covers:

Vertical take-off and landing (VTOL) aircraft, e.g. of the BAe Harrier or Tiltrotor types.

References relevant to classification in this group

This subclass/group does not cover:

Attitude, flight direction or altitude control by jet reaction	B64C 15/00
Rotorcraft	B64C 27/00
Air-cushion vehicles	B60V

B64C 29/0025

[N: the propellers being fixed relative to the fuselage]

References relevant to classification in this group

This subclass/group does not cover:

Without wings	B64C 27/20

B64C 29/0033

[N: the propellers being tiltable relative to the fuselage]

References relevant to classification in this group

This subclass/group does not cover:

With anti-torque means (e.g. tail rotor)	B64C 27/28

B64C 29/0066

[N: with horizontal jet and jet deflector]

Definition statement

This subclass/group covers:

Also covers horizontal propeller/blower and airflow deflector.

B64C 30/00

Supersonic-type aircraft

Definition statement

This subclass/group covers:

- Complete aircraft or structural features described as facilitating supersonic/hypersonic flight, including special shapes and planforms of complete aircraft.

- Sonic boom alleviation means and methods.

References relevant to classification in this group

This subclass/group does not cover:

Airfoil profiles	B64C 3/14

B64C 31/00

Aircraft intended to be sustained without power plant; Powered hang-glider-type aircraft; Microlight-type aircraft

Definition statement

This subclass/group covers:

- Gliders/sailplanes, accessories therefor when they cannot be classified elsewhere.- Microlight, ultralight and Light Sport Aircraft, and safety devices therefore (e.g. Ballistic Rescue Systems).- Hang-gliders (e.g. of the "Rogallo" type).

- Man-powered (e.g. using pedals to drive a propeller) aircraft.- Kites.

B64C 31/02

Gliders, e.g. sailplanes (hang-gliders B64C31/028)

Definition statement

This subclass/group covers:

Also covers accessories for gliders (e.g. insect removal from leading edges) which cannot be adequately classified elsewhere.

B64C 31/028

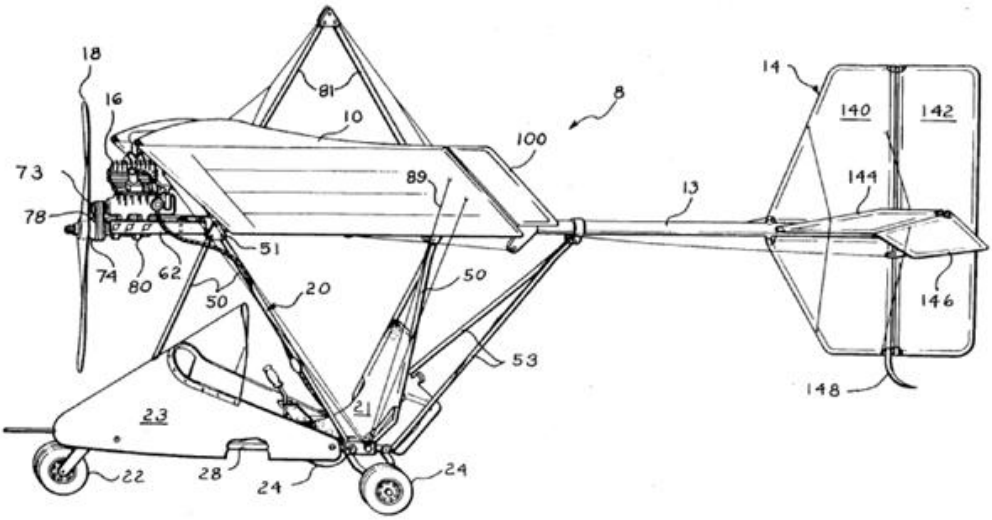
Hang-glider-type aircraft; Microlight-type aircraft

Definition statement

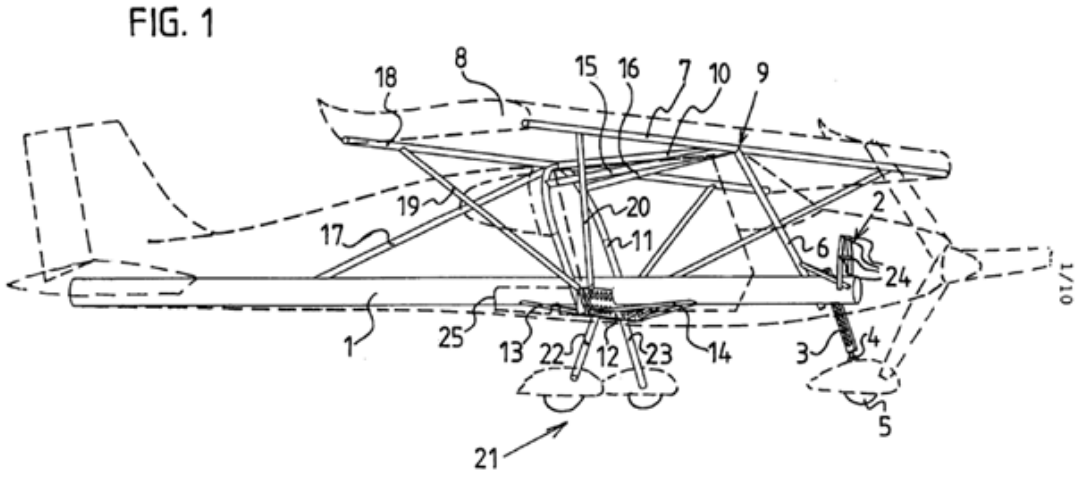
This subclass/group covers:

Mainly very simple and light, powered single or two-seat aircraft with an open frame fuselage, but also covers light, single or two-seat aircraft when the emphasis is on low weight and simplicity, and/or when described as an "ultralight", "microlight" or "light sport aircraft".

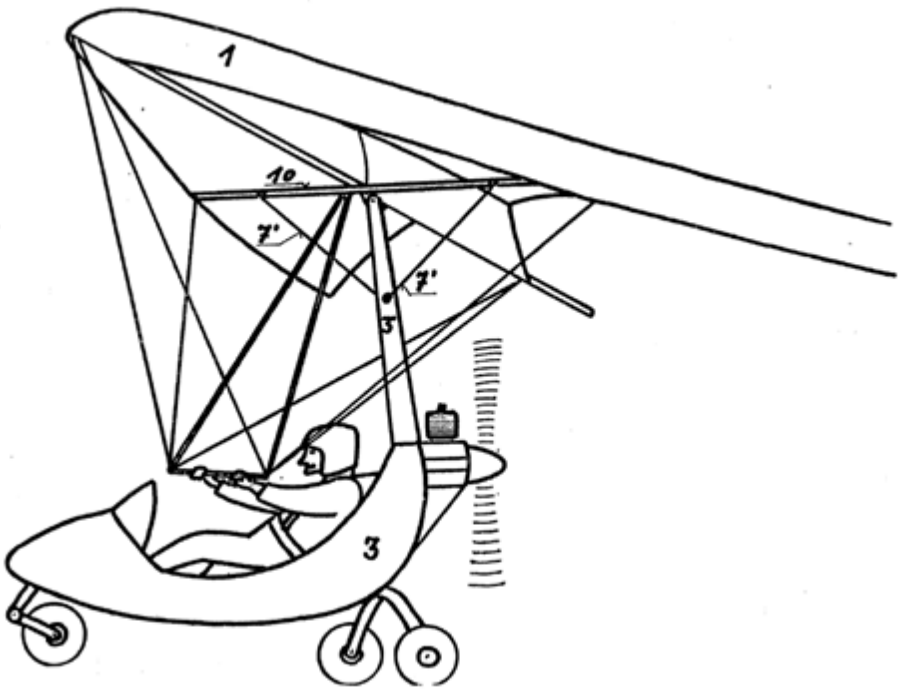
Example (US4548371)



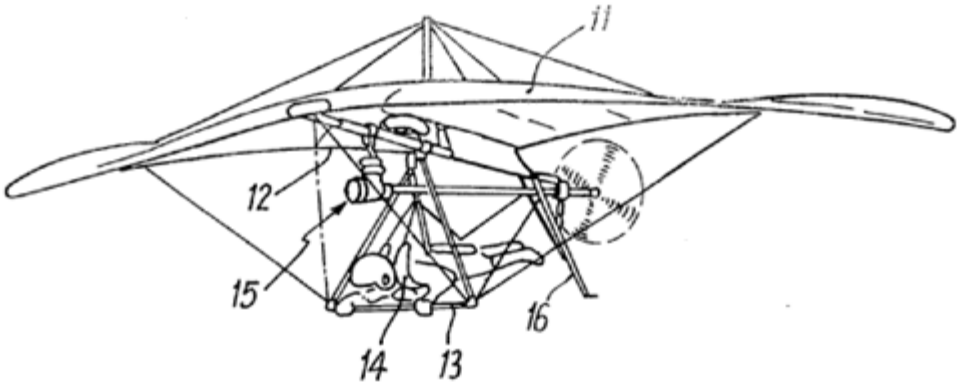
Example (WO2004094228):



Example, "Trike" or weight-shift controlled microlight (DE3346860):



Example; powered hang-glider (GB2164614):



References relevant to classification in this group

This subclass/group does not cover:

Unpowered hang-gliders with delta-shaped wings ("Rogallo"-type)	B64C 31/032

Informative references

Attention is drawn to the following places, which may be of interest for search:

Hang-glider-type aircraft with delta	B64C 31/032

wings	

Special rules of classification within this group

Attribute the symbol B64C 31/032 as well when details of a delta-shaped wing are also disclosed.

Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Microlight or ultralight	Also covers the type of aircraft known in the USA as "Light Sport Aircraft"

Synonyms and Keywords

In patent documents the following abbreviations are often used:

ULM	Avion ultra-légèr motorisé

In patent documents the following expressions/words"ultralight aircraft", "light sport aircraft", "microlight aircraft" and "ultraleichtflugzeug"(german) are often used as synonym.

In patent documents the following expressions/words "trike"(english, german), "weight-shift control" and "gewichtskraftgesteuert" (german) are often used as synonym.

B64C 31/0285

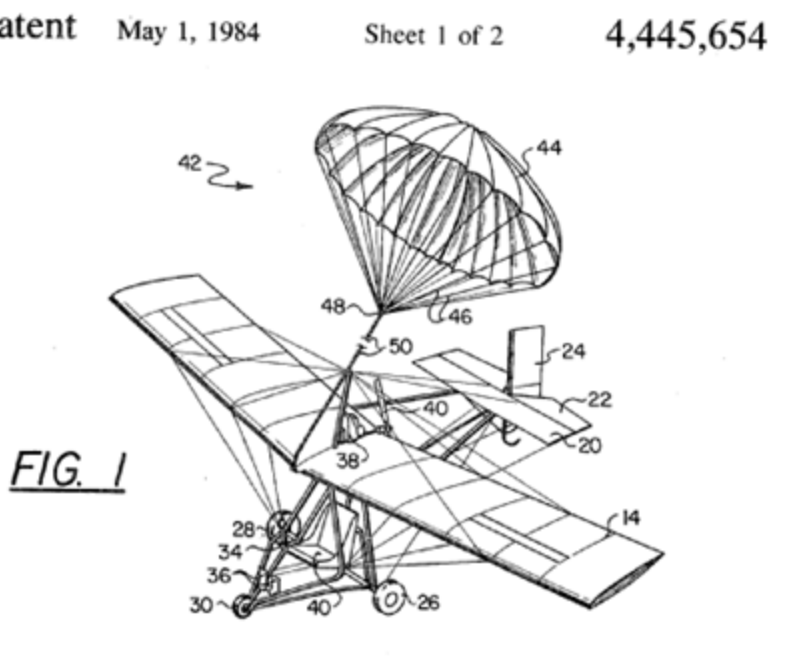
[N: Safety devices]

Definition statement

This subclass/group covers:

For example (ballistic) parachute rescue systems specially adapted to microlight aircraft or hang-gliders.

Example:



Relationship between large subject matter areas

Aircraft emergency apparatus comprising ejectable capsules or even whole aircraft with a rescue parachute: B64D 25/12

B64C 31/032

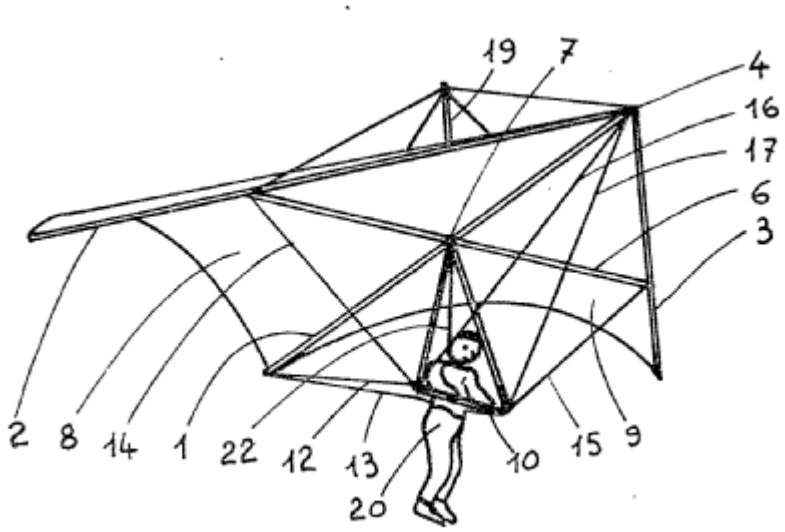
having delta shaped wing

Definition statement

This subclass/group covers:

Mainly unpowered hang-gliders with rigid, delta-shaped wings of the "Rogallo"-type.

Example (FR2286055):



Also covers powered, microlight aircraft when comprising details of such wings.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Powered microlight-type aircraft with such wings	B64C 31/028

B64C 31/036

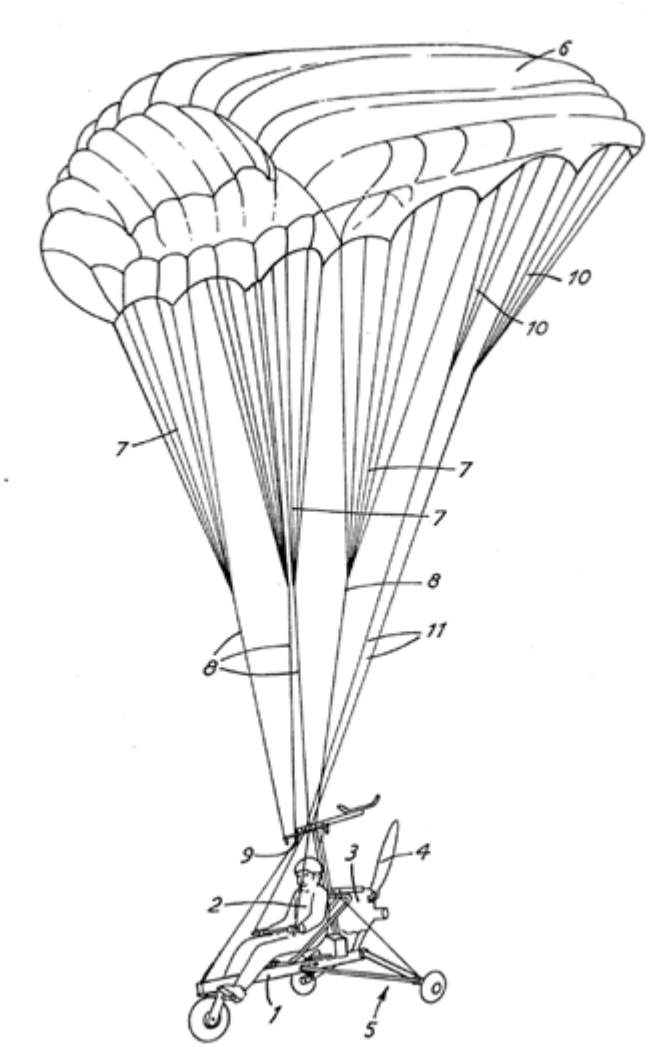
having parachute-type wing (parachutes B64D17/00)

Definition statement

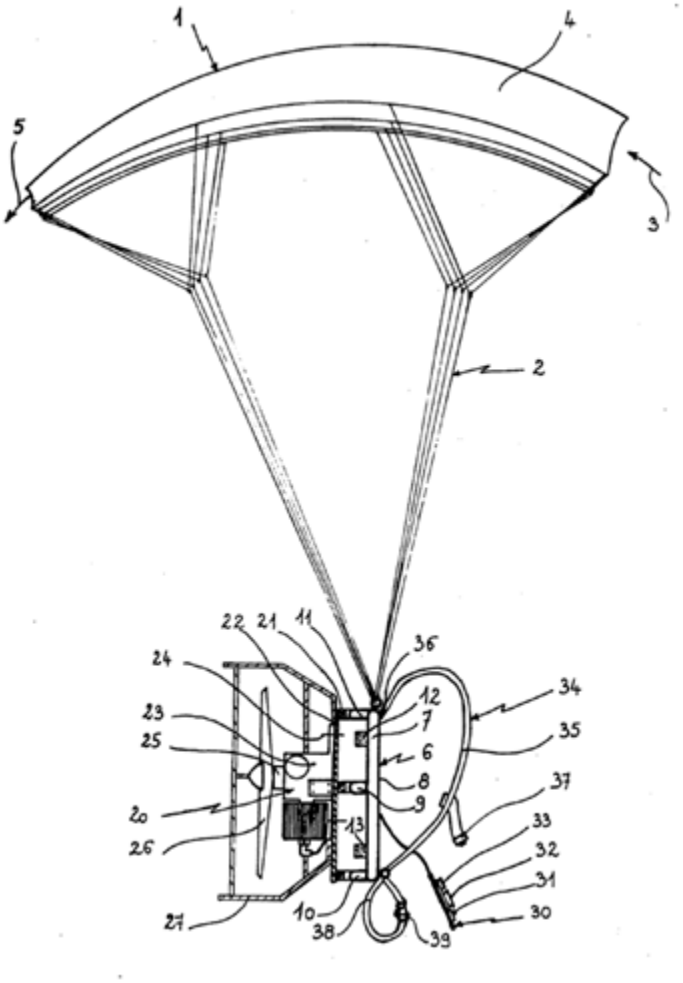
This subclass/group covers:

Microlight aircraft - mainly powered - with a parachute or parafoil type wing attached to a rigid/substantial structure (e.g. framework or rigid seat). Also covers backpack-type powerplants for paragliders.

Example (EP0278784):



Example; backpack-powerplant (FR2606736):



References relevant to classification in this group

This subclass/group does not cover:

Parachutes	B64D 17/00
Paragliders	B64D 17/025

B64C 31/04

Man-powered aircraft (ornithopters B64C33/00)

Definition statement

This subclass/group covers:

Propulsive power produced by the pilot, e.g. pedals connected to a propeller.

References relevant to classification in this group

This subclass/group does not cover:

Ornithopters	B64C 33/00

B64C 31/06

Kites (hang-gliders B64C31/028; toy aspects A63H27/08; towed targets F41J [N: for propelling boats B63H9/0685; for propelling wind driven boards, control means and harnesses therefor B63B35/7976])

References relevant to classification in this group

This subclass/group does not cover:

Toy aspects	A63H 27/08
Propelling wind driven boats, control means and harnesses therefor ("kite surfing")	B63B 35/7976
Propelling boats	B63H 9/0685
Hang-gliders	B64C 31/028, B64C 31/032
Towed targets	F41J
Advertising with kites	G09F 21/06

B64C 33/00

Ornithopters

Definition statement

This subclass/group covers:

All aircraft which fly by flapping the wings.

References relevant to classification in this group

This subclass/group does not cover:

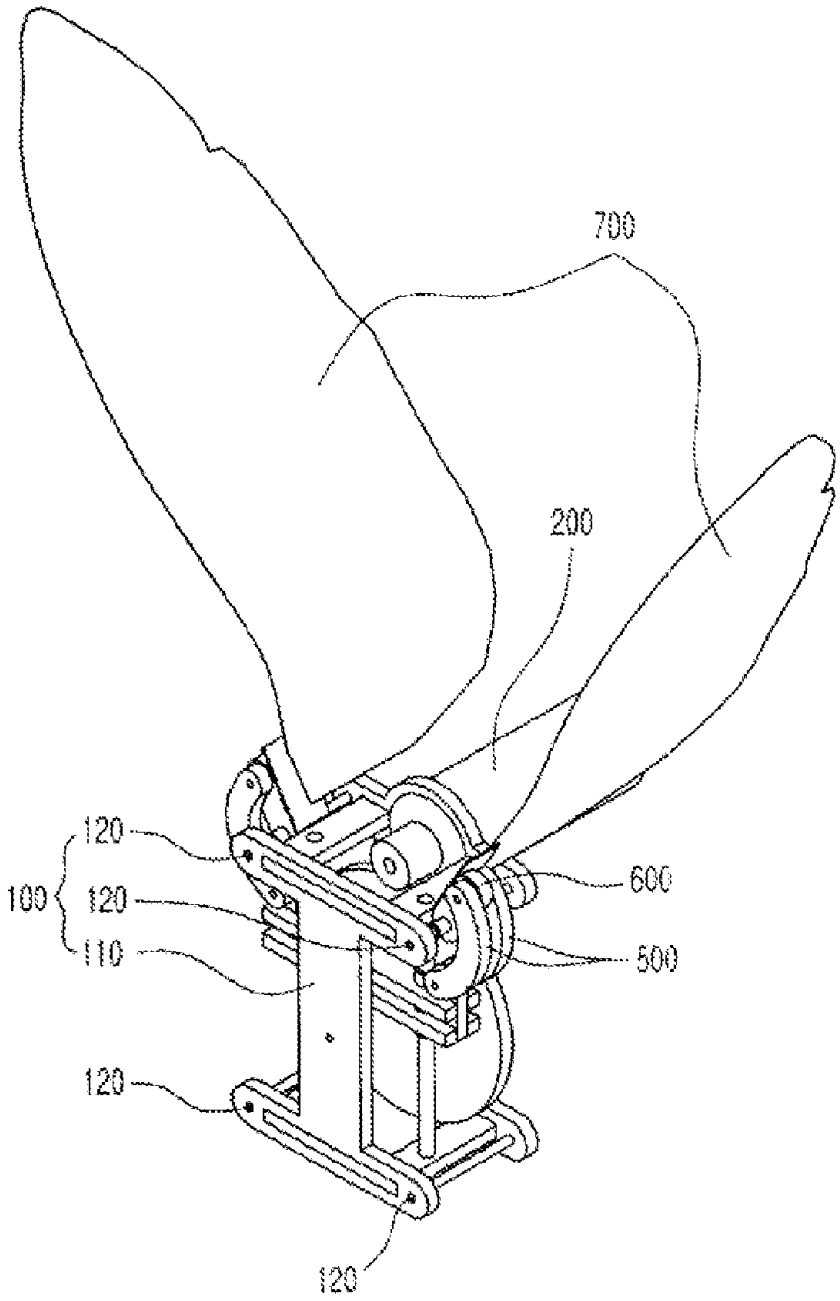
Toy aircraft propelled by flapping of wings	A63H 27/008

B64C 33/02

Wings; Actuating mechanisms therefor

Definition statement

This subclass/group covers:
Illustrative example of subject matter classified in this group.



B64C 35/00

Flying-boats; Seaplanes (alighting gear B64C25/00)

Definition statement

This subclass/group covers:

The word "seaplane" is used to describe two types of air/water vehicles: the

floatplane and the flying boat. A floatplane http://en.wikipedia.org/wiki/Floatplanehttp://en.wikipedia.org/wiki/Floatplanehas slender floats, mounted under the fuselage. Two floats are common, but other configurations are possible. Only the floats of a floatplane normally come into contact with water. The fuselage remains above water. In a flying boat, the main source of buoyancy is the fuselage, which acts like a ship's hull in the water. Most flying boats have small floats mounted on their wings to keep them stable.

Relationship between large subject matter areas

Floats: B64C 25/54

B64C 35/005

[N: with propellers, rudders or brakes acting in the water]

Definition statement

This subclass/group covers:

Comprising devices acting in the water to generate thrust and/or slow down and/or steer the aircraft (e.g. propellers, jets, rudders).

B64C 35/006

[N: with lift generating devices]

Definition statement

This subclass/group covers:

Comprising lift generating devices which are peculiar to the shape of a seaplane.

B64C 35/008

[N: Amphibious sea planes]

Definition statement

This subclass/group covers:

Aircraft suitable for ground and water take-off and landing.

B64C 37/00

Convertible aircraft (vehicles capable of travelling in or on different media B60F)

Definition statement

This subclass/group covers:

Combined road (and/or water) /air vehicles usually provided with wheels (and/or e.g. pontoons) and in-air propelling/thrust means.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Vehicles convertible into aircraft	B60F 5/02

B64C 37/02

Flying units formed by separate aircraft (towing, air-refuelling, or aircraft-carrying aircraft B64D)

Definition statement

This subclass/group covers:

Flying units wherein (possibly after an initial engagement phase) the multitude of (possibly different) flying vehicles (possibly including ground and/or water vehicles and/or dedicated units) are permanently connected.

Relationship between large subject matter areas

In-flight refuelling : B64D 39/00

Aircraft adaptations to facilitate towing or being towed: B64D 3/00

Aircraft transported by aircraft: B64D 5/00

Aircraft having multiple fuselages or tail booms: B64C 39/04

B64C 39/00

Aircraft not otherwise provided for

Definition statement

This subclass/group covers:

Essentially all the flying vehicles not classified in one of the previous groups, highly unconventional aircraft.

B64C 39/001

[N: Flying saucers]

Definition statement

This subclass/group covers:

Flying vehicles characterised by sustainment without aerodynamic lift, often flying disks having a UFO-shape.

Relationship between large subject matter areas

Rotorcraft characterised by having shrouded rotors, e.g. flying platforms: B64C 27/20

References relevant to classification in this group

This subclass/group does not cover:

Aircraft having annular wings with radial airflow	B64C 39/064

Informative references

Attention is drawn to the following places, which may be of interest for search:

Inertia motors	F03G

B64C 39/003

[N: with wings, paddle wheels, bladed wheels, moving or rotating in relation to the fuselage (rotorcraft B64C27/00, ornithopters B64C33/00)]

Definition statement

This subclass/group covers:

Example taken from GB2403460

SHEET 1/1

Fig 1

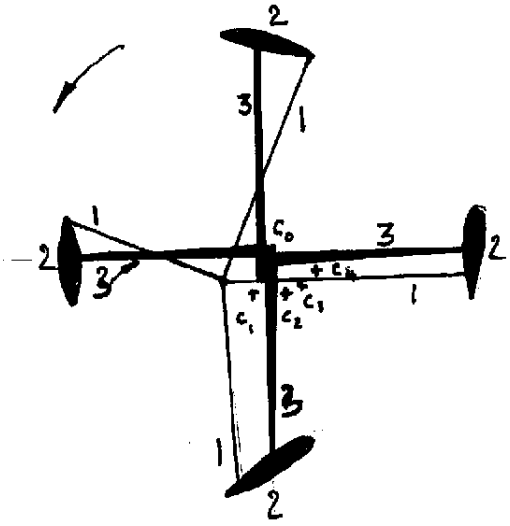
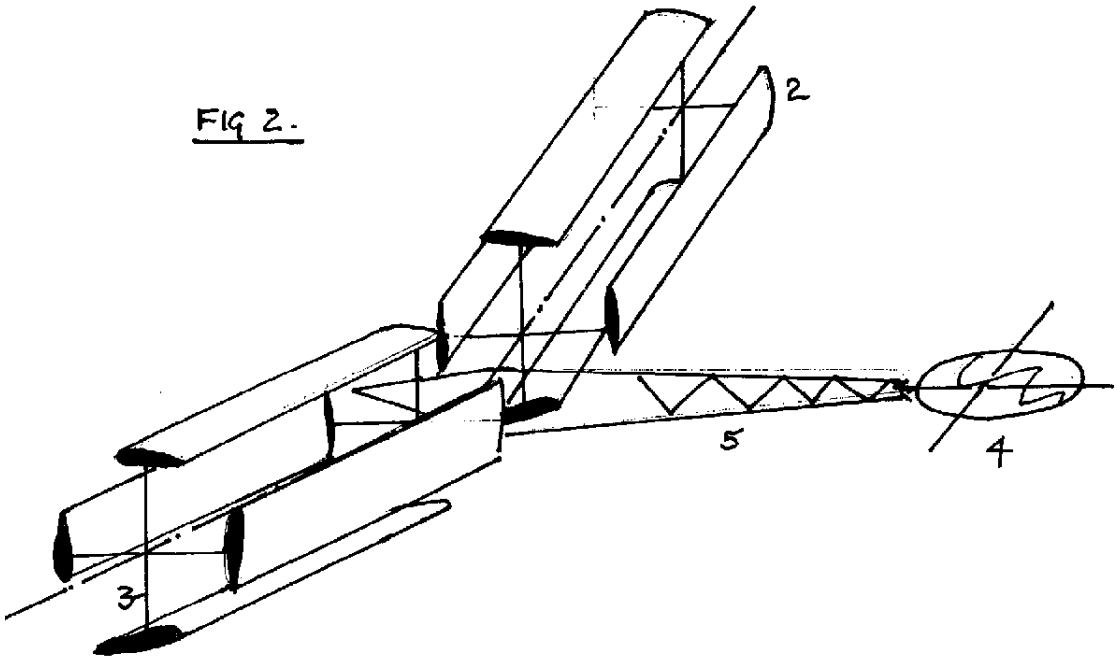


Fig 2.



Relationship between large subject matter areas

Using Magnus effect:B64C 23/08

Paddle wheels: B64C 11/006

B64C 39/022

[N: Tethered aircraft]

References relevant to classification in this group

This subclass/group does not cover:

Captive toy aircraft	A63H 27/04

B64C 39/024

[N: of the remote controlled vehicle type, i.e. RPV]

Definition statement

This subclass/group covers:
UAVs, UCAVs, drones, remotely piloted flying vehicles in general

References relevant to classification in this group

This subclass/group does not cover:

Controlling aircraft by using radiated signal	B64C 13/20
Model aircraft	A63H 27/02
Model helicopters	A63H 27/12

B64C 39/026

[N: for use as personal propulsion unit]

Definition statement

This subclass/group covers:
Devices including rotors, wings, propellers, turbojets to be "worn" by a user.

Relationship between large subject matter areas

Parachutes: B64D 17/00

Ornithopters: B64C 33/00

Rotary wing parachutes: B64D 19/02

B64C 39/028

[N: Micro-sized aircraft]

Definition statement

This subclass/group covers:

MAVs (micro aerial vehicles), usually for military purposes, any maximum dimension of which does not exceed 15 cm (6 inches).

B64C 39/04

having multiple fuselages or tail booms

Relationship between large subject matter areas

Flying units formed by separate aircraft: B64C 37/02

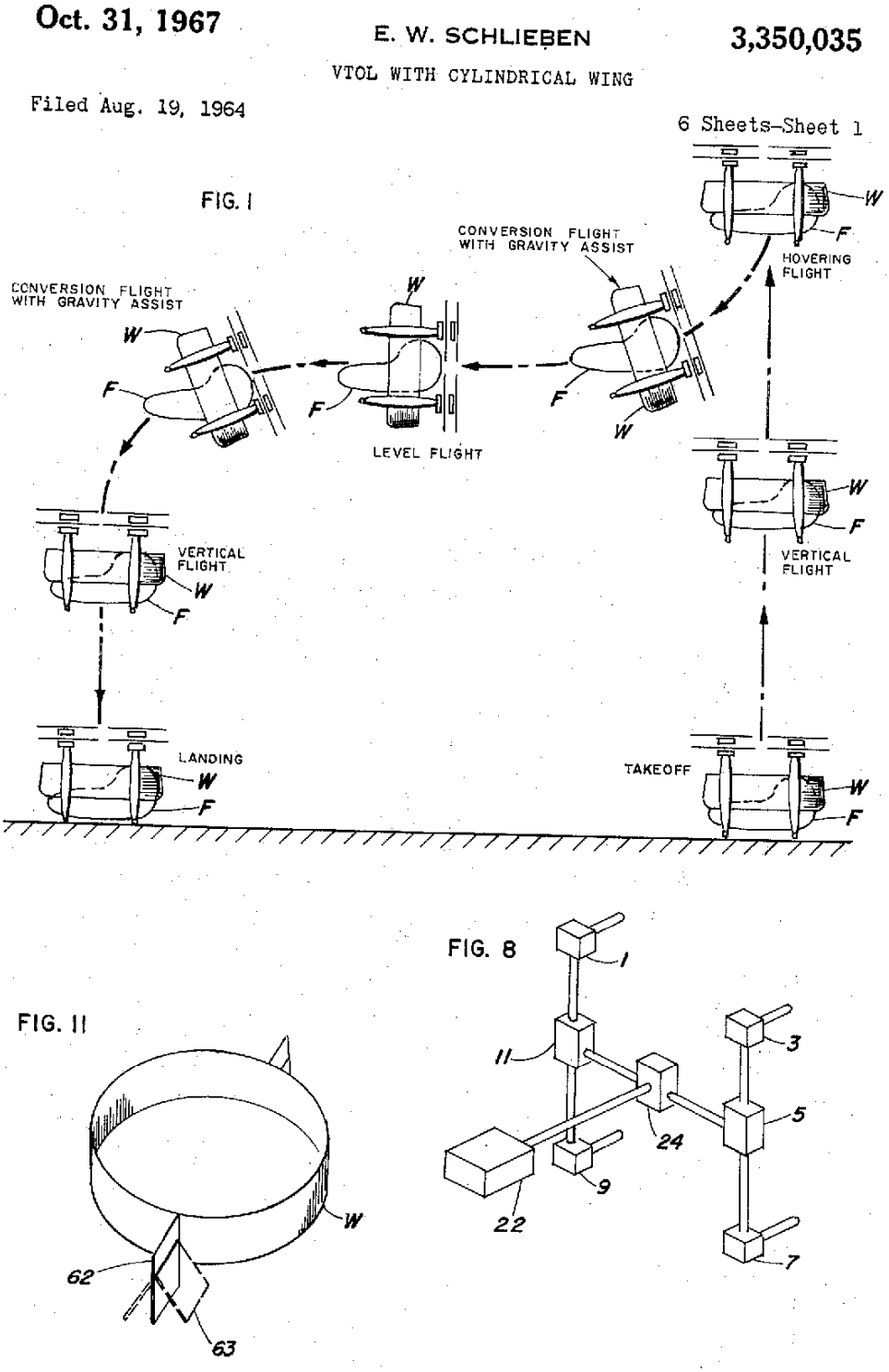
B64C 39/06

having disc- or ring-shaped wings [N: (B64C39/001 takes precedence)]

Definition statement

This subclass/group covers:

Illustrative example of subject matter classified in this group.



Relationship between large subject matter areas

Aircraft capable of landing or taking-off vertically, having its flight directional axis vertical when landed: B64C 29/02

References relevant to classification in this group

This subclass/group does not cover:

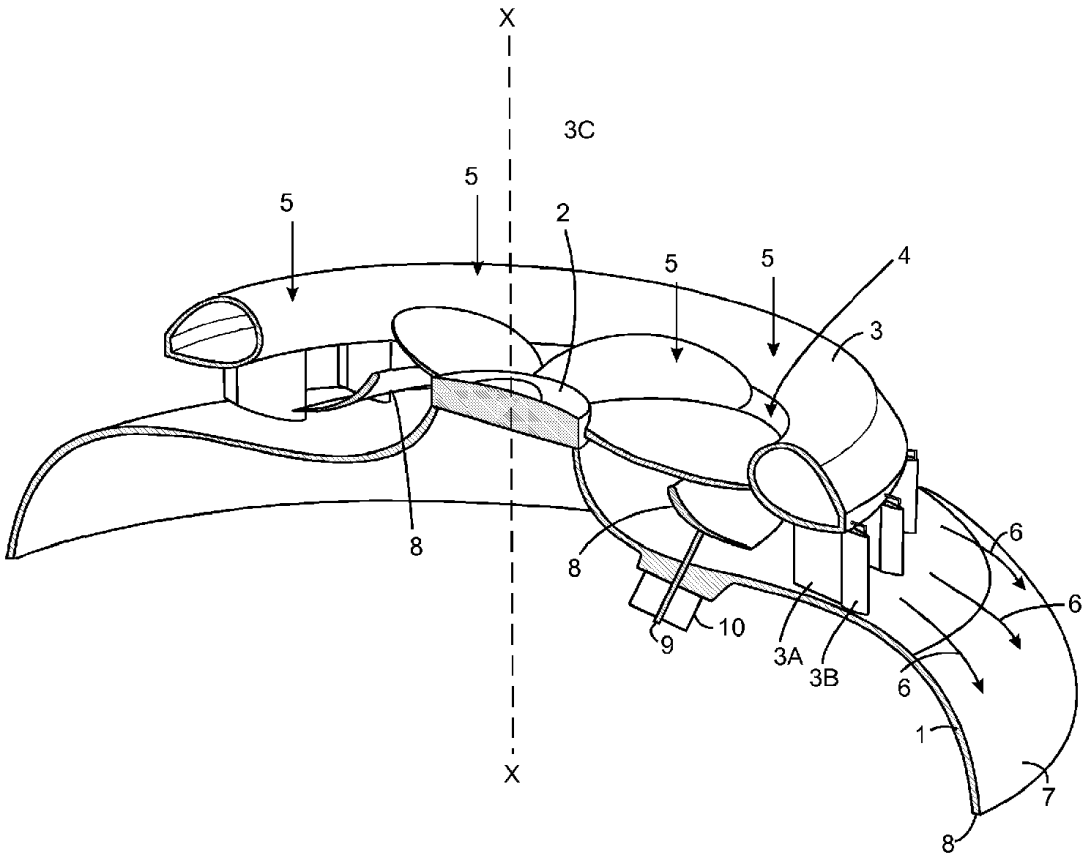
Takes precedence	B64C 39/001

B64C 39/064

[N: with radial airflow]

Definition statement

This subclass/group covers:
An example taken from GB2471663



Relationship between large subject matter areas

Flying saucers: B64C 39/001

Informative references

Attention is drawn to the following places, which may be of interest for search:

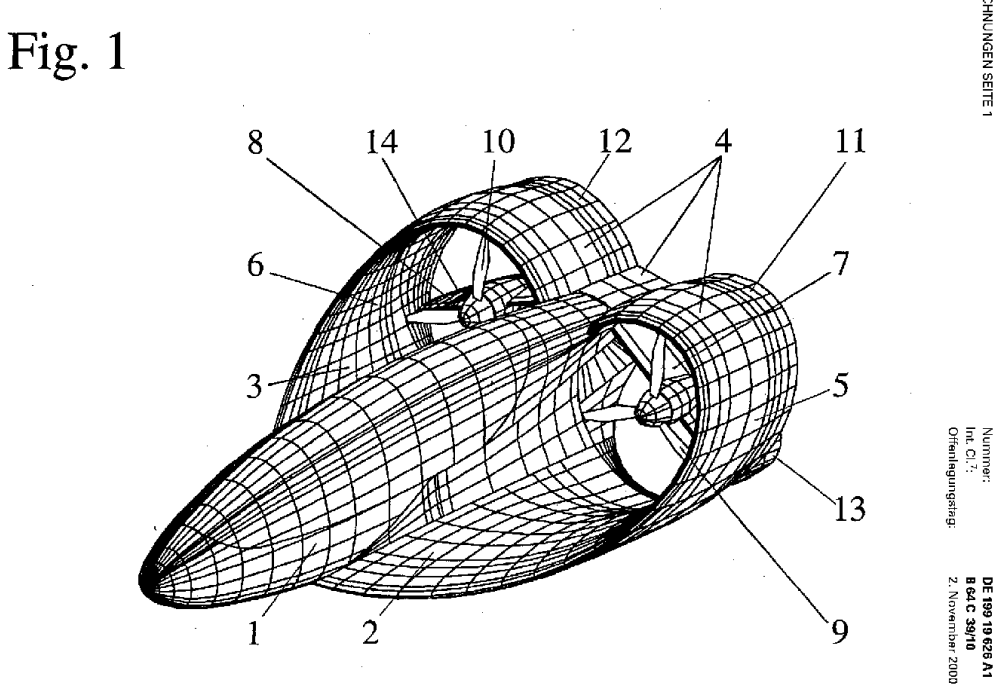
Coanda effect flying vehicles	--

B64C 39/066

[N: having channel wings]

Definition statement

This subclass/group covers:
Illustrative example of subject matter classified in this group.



Relationship between large subject matter areas

Frontal shape of wing: B64C 3/16

B64C 39/068

[N: having multiple wings joined at the tips]

Definition statement

This subclass/group covers:
Illustrative example of subject matter classified in this group.

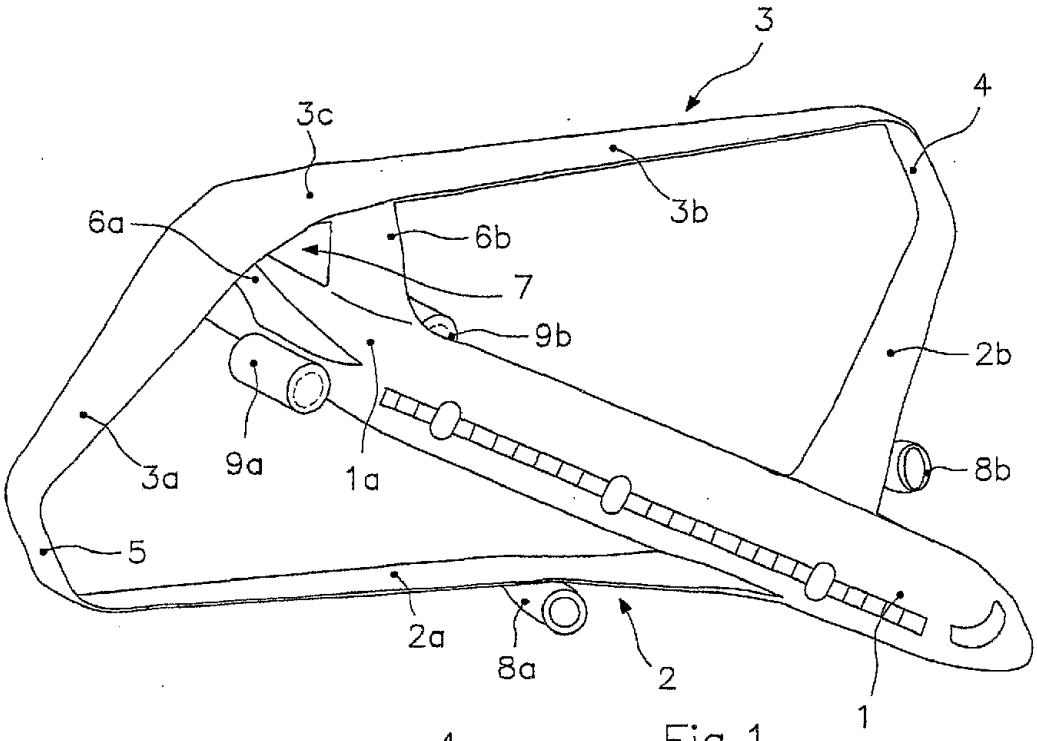


Fig.1

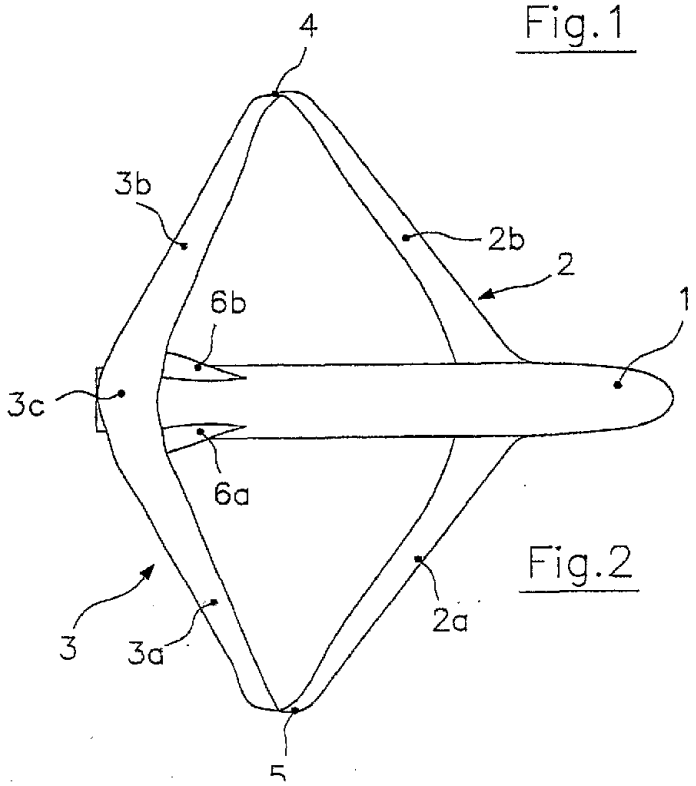


Fig.2

Relationship between large subject matter areas

Frontal shape of wing: B64C 3/16

B64C 39/08

having multiple wings [N: (B64C39/06 takes precedence)]

Relationship between large subject matter areas

Canard-type aircraft: B64C 39/12

References relevant to classification in this group

This subclass/group does not cover:

Takes precedence	B64C 39/06

B64C 39/10

All-wing aircraft [N: (B64C39/001 takes precedence)]

Definition statement

This subclass/group covers:
This group includes e.g. the BWB (blended-wing-body)-type aircraft

References relevant to classification in this group

This subclass/group does not cover:

Takes precedence	B64C 39/001